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AVIATION
May, 1935



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TEXACO

AVIATION
GASOLINE
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Aviation GASOLINE

AVIATION
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7

*Anniversary
Celebration*

CHICAGO & SOUTHERN *Air Lines*



LOCKHEED has no competitors in the world. Its new biplane has made the safety and efficiency of modern flight.

Charles F. Johnson

Chicago & Southern Air Lines



CASSION FURMAN
President and Founder

of Chicago and Southern Air Lines
of Chicago and Southern Air Lines
of Chicago and Southern Air Lines



Through the years the "Valley Level Route" has grown steadily in importance to the whole people of the United States.

Connecting every transcontinental air line with schedules carefully designed to provide the maximum in frequency and convenience, Chicago and Southern offers the traveling public quick access to every important city of the mid-west and south. In this it has been assisted by the superb airport facilities of Chicago, New Orleans, Memphis and St. Louis, by a federal airway of exceptional excellence, by the unfailing support and patronage of the communities which it serves, and by the constant cooperation of all the nation's air transport systems.



D. S. WALKER

Mr. Walker is President of Chicago and Southern Air Lines.



BRUCE E. MASON

Mr. Mason is President of Chicago and Southern Air Lines.

"THE RAINBOW" Afternoon Flights Return to Chicago and Southern's Schedule May 1st

In fitting commemoration of its second anniversary, Chicago and Southern again presents "The Rainbow", leaving Chicago daily at 4:00 p.m. with arrival in New Orleans 10:05 p.m., and leaving New Orleans at 1:00 p.m., with arrival in Chicago at 7:00 p.m. Extra fast—a extra fast. The addition of "The Rainbow" to the Chicago and Southern fleet increases service over "The Valley Level Route" to 3 flights each way, each day.

Completes TWO YEARS of SERVICE on "THE VALLEY LEVEL ROUTE"

ON MAY 1, 1936, the first twin engine planes to serve the Mississippi Valley began operation between Chicago and New Orleans on six-hour schedules. These planes, the engines which power them, the fuels they burn and the accessories with which they are equipped, to-

gether have set an enviable record of dependability in two and a half million miles of operation. The management of the company, while taking a pardonable pride in the line's national standing, desires particularly to acknowledge the excellence of the products which have made this record possible.

Pays Tribute to the Following Manufacturers

LOCKHEED Airplanes

Chicago and Southern are proud to be the first to use the Lockheed biplane. This plane has made the safety and efficiency of modern flight. It is the only biplane in the world.

HAMILTON STANDARD Propellers

Hamilton Standard propellers are the only propellers in the world. They are the only propellers in the world.

PIONEER Instruments

Pioneer instruments are the only instruments in the world. They are the only instruments in the world.

WESTERN ELECTRIC Radio Equipment

Western Electric radio equipment is the only radio equipment in the world. It is the only radio equipment in the world.

WRIGHT Engines

Wright engines are the only engines in the world. They are the only engines in the world.

GOODYEAR Tires

Goodyear tires are the only tires in the world. They are the only tires in the world.

B. G. Spark Plugs

B. G. spark plugs are the only spark plugs in the world. They are the only spark plugs in the world.

PESCO Pumps

Pesco pumps are the only pumps in the world. They are the only pumps in the world.

SHELL Gasoline

Shell gasoline is the only gasoline in the world. It is the only gasoline in the world.

ECLIPSE Starters

Eclipse starters are the only starters in the world. They are the only starters in the world.

SINCLAIR Pennsylvania Aircraft Engine Oils

Sinclair engine oils are the only engine oils in the world. They are the only engine oils in the world.

KOLLMAN Instruments

Kollman instruments are the only instruments in the world. They are the only instruments in the world.

'The Valley Level Route'



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From the Skyways of the World

✦ Here's one that no U.S. airline press agent has thought of yet as an idea for a traffic drop. A release from the Dutch colonial airline K.N.I.L.M. states: "About 1,000 passengers estimated themselves to the K.N.I.L.M. which is approximately the same amount as for January 1943 and even higher than for the same month of 1936. January 1944 was marked by a decided lack of traveling spirit. People were looking forward to the happy event in the Royal Family and preferred to stay at home as much as possible." [The italics are ours.—Ed.]

✦ Announced during the recent Los Angeles aircraft show was Wladislaw Waterman's latest invention, a military airplane of his flying reconnaissance. Wladislaw's idea is to give the Arrowhead a little more power, equip it with a machine gunner in a suitable turret, and use it as a flexible command car. "Theory is that such portable machine gun units be flown to the site of enemy lines in considerable numbers, then to shed their wings (on the ground, of course) and trundle off to heavy enemy troops with a concentrated machine gun attack.

✦ AVIATION's editorial staff has been on the loose again in a big way. Arrives toward Los for the month ended over 15,000 miles with Sayre's loop at New York to Los Angeles to Seattle and back, and the editors' trip to Los Angeles-San Diego and return. Altogether we had a close-up look at operations on TWA, WAA, CAA, and NWAA, visited Douglas, Lockheed, Vultee, Consolidated, Ryan, Stearman, Boeing, Cessna-Wright, Teich, Aero ITL, and a dozen other important western manufacturers. Not to mention attendance at the Los Angeles Show (See page 20)—and a look-out at the movie industry—thanks to Fran-

coise, whose technical production "Men With Wings" will shortly be in circulation.

✦ INCIDENTALLY, for "Men With Wings" Paramount has assembled an extraordinary collection of war-time airplanes, some real, some phony, some of them dyables. The lineup on Van Ness airport at Falmers, 35-35,

Spaul, Minneapolis, D.H.-6 and Cessna took us back to our Cade's days at 1943 when we had to be able to recognize them all while away from a little look at themselves.

✦ Earl Ostrom staged a National Air preview for some of the boys at the Los Angeles airport show when he ran an unofficial trial speed run around the 10-mile triangular closed course at Los Angeles airport. Earl pushed the throttle open on his Pratt & Whitney powered Roder racer and roared around one lap for a total time of 32 min. 26 sec., averaging 258.8 mph for the 50 mile distance and turning his fastest lap in a shade better than 300 mph. It was all very official but also quite confusing.

✦ Out of the basement of the Electronics Traveler Corp. display at the L.A. show was a framed page from 1917 copy of Aviation magazine in which the original editorial on machine power was described. One of their best models was displayed.



"Maybe he heard that Senator Florkheim is playing him for the Aviation Convention!"



Linked!

We sincerely believe that landing-gear layout is the essential key design and build should be a shared responsibility... and we earnestly urge you to permit us to share it with you.

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AIRPLANE WHEELS • BRAKES • PILOT SEATS • PNEUMATIC SHOCK STRUTS

AVIATION
May 1944



By
**ROBERT
OSBORN**

★ YEAR—soon climatologist Dr. Charles Tinsford assured the world with his reports that the deer hardly had a top speed of over 300 m.p.h., making it the fastest thing on earth. However, Dr. Irving Langmuir has just concluded a series of experiments which prove that the hare is actually capable of a high speed of about 25 m.p.h.

We hope that this correction of his figures will not prove too disastrous to Dr. Tinsford, at with this revelation he should be able to obtain a



well-kept position in the publicity department of some airplane manufacturing company.

★ U. S. Army engineers say that in the process of "mechanizing" the cavalry organization they are going to discard the Army rule altogether, replacing the path travel of old with motor tracks and cargo airplanes.

As a result of this change many well-meaning may fear that the traditionally solemn and violent language of the male driver may be lost to posterity, but we can reassure them with the knowledge that the airplane

engineer will still have to be started on cold days.

★ IT IS NOT A SURPRISE to be cruising along enjoying the scenery in some private plane this summer and some farmer that a couple of pot shots at you, don't consider it as a personal matter. The farmer probably will have been hunting a couple of snipe, crabs or some other bird he was supposed to have shot and he is shooting will be just as long for the "newsman" news. You see the Agricultural Adjustment Administration has decided to make snipe traps this summer to check up on the snipe the farmers have actually shot.

★ AN A. P. DISPATCH tells of an aviator pilot who found himself with a landing gear stuck in the intended position. For a while he thought he would have to make the best of a bad situation with a landing in that condition, but finally "Working on radical instructions, Hoffmann took up the plane's floor boards and lowered the wheel with a saw strap while his co-pilot cranked the field."

Experience at Underhill with the old Model "T" Ford has proven valuable to many pilots and mechanics—and designers too. As we recall our own Model "T" driving performance, we used to get about one mile per minute with three miles per hour on the road.

of the road and twenty miles per hour taking up of the four hours.

★ IT IS PROBABLE that modern airplane design owes more to the family dog, mouse, crane, squirrel, and Model "T" than to quantity of fuel. One of the best designers in the world of clever gadgets and foreign (or airplane) always passed off complaints on his men about work, "Oh, I saw that design on a paper and heard years ago."

We have always been amazed at the aviation airplanes turned out before and during the war by the early designers, who had been recruited from the farms near the factories. Most of them had no more technical education than a Chamber of Commerce and yet many airplane design engineers have been startled to find that their inventions were anticipated by patents granted to these farmer designers twenty years before.

★ READERS will probably remember the old joke about the London politician who was groping his way along a street, completely lost, in one of the famous English gas mask logs. At a shadow passed by him in the gloom he asked, "Pardon me, sir, can you tell me where this street will take me?" and the man from the fog answered, "Yes. Into the river. I just chased out of it."

This story makes me a bit discon-



cerned about the new S. Davis William Airport in Philadelphia, recently dedicated. The newspaper description of the dedication is the Evening Public Ledger, of that city, states, "While about thirty thousand people gathered in a blood runway under construction, it took to the river and is the basis of photo landing in fogs."

★ THE AIRPLANE PILOT should have his little job, it seems, regardless of the situation. According to a news item recently a pilot had a forced landing in a field near down. His plane promptly sank but he managed to swim to safety, unharmed by would-be rescuers. When they last appeared on the scene of that could be heard was "a faint and a pair of goggles floating on the surface."

AVIATION
May 1944



THE COAST GUARD

PEOPLE who think of Service Aviation are prone to think in terms of Air Corps and Naval Aviation only, and to overlook entirely a smaller but equally important branch—The Coast Guard. About the only time the Coast Guard gets its due share of publicity is on those rare occasions when ships have at sea, or when a seizure on a freighter comes down with appendicitis and has to be transferred ashore in a hurry. But beyond such occasions that make headlines, our Coast Guard Aviation is carrying out a multitude of duties, day in and day out, on a scale that the average citizen knows nothing about. In this issue we have tried to go behind the scenes with the Coast Guard, pointing out, rightly, perhaps, over the spectacular elements, but trying to find out just what and who make it tick. It should be obvious to anyone who reads Mr. Sayer's story of Coast Guard Aviation that it is a branch of government service that rates a great deal more credit than is usually accorded it, and that it is an important element in our national defense, both in peace time and in war time. (Left: A C.G. Hall-Albemarle patrol boat, about R.M.S. Queen Mary over New York Harbor.)

PROBLEM NO. 2

LAST MONTH we presented a series of arguments in favor of the establishment of a centralized Aviation Authority. So far the matter of passage of the existing legislation is still in abeyance, with the odds better than even on the passage of the revised Lee and McCarran bills.

Assuming, therefore, that something will be done before Congress adjourns to go about repairing its political fences in the hinterlands, the next important problem to be considered is the matter of personnel for the Commission. The ultimate success or failure of the idea depends almost entirely on the type of commission selected. Clearly, if appointments are to be made on a purely political basis we may find ourselves much worse off with a Commission than without.

AVIATION for May, 1938

it. Naïve as it may seem to some, however, we are quite hopeful that the administration is recognizing the importance of the situation and will make its selections on a basis of fitness rather than of political expediency.

The essential qualifications for selection are not difficult to write down. Obviously, membership should be made up of men with a wide knowledge of the aviation industry, men who know intimately the problems facing its several elements, men capable of taking a broad, long range view of aviation's complicated problems. Furthermore, the interests of the commission should be horizontal rather than vertical. There is some danger in having individuals who are too definitely committed to promoting a special interest in this or that phase of aviation. All members should have had experience and training broad enough to cut through any such narrow partialities.

Not only must professional interests not be a conflict, but it is also important that the men chosen be personally compatible. We have too many outstanding examples of government commissions which have failed in their objectives because of personal differences among the membership. The recent TVA dispute and the troubles of the Civil Commission are but two outstanding examples. Not that the members of any commission must be unanimous in all their opinions, but the really important element is an ability to settle their differences of opinion amicably and on a rational basis.

It may not be an easy matter to obtain five qualified men who can work together, but it is an ideal that must be accomplished if the new Authority is to successfully solve aviation's present problems and start it off on the road that will give it the utmost freedom of development. Here is a rare opportunity, however, for the entire aviation industry to exhibit an unusual degree of good will in patterning the administration to select a group of men to handle its affairs in the future on the broadest possible basis, without attempting to shackle them to the preconception of special interests. We are very hopeful that it can and will be done.

DFs NEEDED

THREE times within we have had incidents that have shaken a hair of trusting pilot accidents, and which have shown up a very serious fault in our present system of air navigation aids. In both cases, transport airplanes carrying passengers were blown off their courses, wandered about aimlessly in storm conditions, and partly through good luck and partly through good management, finally landed safely with fuel tanks practically dry.

In both cases the aids to navigation available to the pilots from ground stations or in their own equipment failed to indicate to the pilots their true positions, although in neither case were radio sets impervious. They were both caught out in conditions in which every element piled up on the negative side. In spite of the radio range network, and in spite of radio compass installations on the ships, neither pilot was able to work out his problem in time to avoid exposing his ship and his passengers to extraordinary hazards.

The one thing that was lacking in the picture was the ability of the ground to get bearings on the aircraft. If there had been available at two or three points along the eastern seaboard direction finding equipment on the ground, neither one of the pilots would have been lost for more than a few minutes at the most. Continuous cross bearings from two or three stations could have given "fixes" at short intervals and the pilots could have been directed toward weather-free airports long before their fuel approached the point of exhaustion.

We do not believe that our radio range system should be abandoned in favor of DF in the European plan for ordinary flight or coastal, but we are convinced that there should be at least a dozen well-equipped DF stations scattered about the country which could be instantly available to monitor any flights that wander away from the airports under extraordinary conditions. Such a step is essential to close the last gap in the present pattern of air warning aids. For safety's sake something should be done about it before another winter sets in.



The great advance in equipment—a pilot saw of EAL's progress from Mid West days, through the Douglas C-47s to the present DC-3s and DC-4s.

Congratulations EAL

—endorse on its second decade of flying operations with Captain E. V. Rickman at the controls.



On May 1, 1934, East Eastern Express initiated such a flight—a few yards of mail in passenger plane Aviation service. Since the line covered 763 route miles, served 17 cities, carried 40 passengers, handled 100 tons of mail per month. Today EAL routes cover 1,441 miles, touch 33 cities. Passengers average 18-20,000 and mail 112,000 lb. per month.





Every Coast Guard station has at least one Curtiss P-11 amphibian. They are valuable, too, for shipboard service.



"Semper Paratus"

—or the Coast Guard's way of saying "We're always on the job." Few of us realize what Coast Guard service really has become. The story of a group of superquiet citizens who could slightly toll a hundred-decked horn in any flying league.

By Daniel Seyore

Special Editor, AVIATION

YOUNG MEN CAN BEY UP WHEN WITH SERVICE, but there are few facts about the Aviation Division of the U. S. Coast Guard that ought to be more widely appreciated. (1) Its entire mission does not consist of guarding ships from remotely comparable to it. (2) Few other governmental agencies receive such dollar dividends for each ten hours worth of public expenditure. (3) The Coast

Guard's flying has become a substantial item in the country's operating budget, as government is becoming an important source of equipment orders, in major operating expenditures, in building up another of these "be bad to come in" units the great American industrial and administrative leadership.

The first really big enterprise—only a few centuries—such as Rep-

bul Government. From-ports will developed most guard service of the pre flying type. Some time in have granted the great apparatus in the field for the use of service. When coastal guard flying they can carry out in done by means of some military or naval service—not by a separate specialized organization trained and equipped for this particular type of service.

Our second point—the cost part—in any. Expenditure of appropriations for new equipment, the total cost in the history of the United States of all coast guard flying was \$135,000 for the year ending June 30, 1937. It is to be \$135,000 for the year ending June 30, 1938. \$30 has been saved for the fiscal year ending twelve months after that. This includes pay, food, clothing, fuel, transportation, Washington office expenses—everything.

Exclusion of the rest returns—looking the Coast Guard's (it is) right into the value of a life saved, a wreck averted, a lawbreaker apprehended — is more difficult. The Coast Guard aviation has been assigned all that part of the Treasury Department's task that can be of benefit to the public. This includes the maintenance of records and persons in distress at sea, the spotting of smuggling along our borders, the spotting of recreational activities (mountain trails to sea) anywhere in the United States;



Weather reports. As double duty in the Coast Guard. They are critical factors in all offshore flights. They must be always be referred to determine jobs not equipped with radio. Above left is a statement and that dropped in a business meeting to make a record. Below left, a speaker. Statement made over a wireless. Statement made of his kind are given for Coast Guard had to work out special to help working for use of the Marine Corps.



A typical anti-aircraft equipment seen in typical anti-aircraft Coast Guard station at St. Petersburg, Fla. Note the machine's structure and the white facilities. A few years ago this was a house and apt.



the transport of distressed persons, storms, food supplies and medical personnel during such flights at last year swept the Ohio and Mississippi valleys. It takes in the warning of vessels of impending danger whose such small are not equipped with radio. It means cooperation with government experts on surveys of local conditions, conditions of life, land navigation or any other useful purpose. For almost any single one of these items, the government might expect a small credit in the Aviation Division's total allowance and no budget error would so much as cause the ap-

Exhibit A

Air Search (hours) (miles)	50,000
Vessels Inspected	2,944
Aircraft Inspected	1,444
Obstructions to Navigation Reported	30
Smuggling Vessels Located	20
Smuggling Aircrafts Located	2
Ellen Lindbergh Located	360
Rescue for Aviation	506
Persons Arrested	359
Persons Wanted of Arresting	204
Deaths	1
Persons Transported from Distressed Vessels	11
Persons Observed Transported and Arrested	548
Emergency Medical Cases Transported	145
Incidents of Assistance to Other Government Departments	428
Vessels Wanted of Departing	168
Deaths	168
Deaths Vessels Located	114

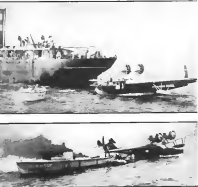
lowers. As it is set for "Exhibit A" into the evidence and pass on. If you are not impressed, remember that the Coast Guard, upon the declaration of war, passed immediately into the naval service. The Navy would probably not let you coast guard flying would be worth what it would if it never did anything from one year's end to the next save itself as a great reserve.

Our third point—the Coast Guard flying is becoming an element of first rate importance in American commerce—in what we really want to talk about.

Let's go back to business. Life safety as offspring of the U. S. Coast Guard is considerable business as in just how old the Aviation Division really is.

It is more than twenty one years old if you consider it was born on August 29, 1915 when the President approved an Act of Congress which provided:

For the purpose of saving life and property along the coasts of the



Bayless High Sam Bauman: Top, a North Ansonia flying boat takes a badly injured swimmer off a steamer. Within a few hours he will be receiving the best of hospital care when he returns. Below, a Duxbury Seabee takes off the crew of a hoisting barge.

United States and all its cognate charts, and to assist in the National defense, the Secretary of the Treasury is authorized to establish, equip and maintain aviation stations, not exceeding ten in number, at such points on the Atlantic and Pacific Coasts, the Gulf of Mexico, and the Great Lakes as he may deem advisable, and to detail for aviation duty in connection herewith officers and enlisted men of the United States Coast Guard."

Since Congress wanted to provide any funds for such stations you are not as well, couldn't the Aviation Division be 100 years old?

In 1939, wing on surplus warplanes loaned by the Navy, and methods of Coast Guard flying personnel, who had been based at the Naval Air Station, Pensacola, the Coast Guard established its first flying base at Morehead City, N. C. Located though it was, the expense was well worth the first rate documentation of

What action could be taken to speed work? But still Congress would pay no bills for lost or found. If the Dismas was born in 1952, it must have died late in 1952 when Montford City was reached.

For a plane with a 100-mile range, the Spruce Goose was a "long-legged" 100-ft. machine, an airplane that could fly over water—but not through it. The Navy's military appropriations bill to permit the purchase of the Coast Guard amphibian. Within a year, my company was in operation at Tutuila Island in American Samoa Harbor, Samoa, and at Cape May, N. J. The former was equipped with two OH-5 Loening amphibians powered by inverted Liberty engines and one Vought UO-4 seaplane with a J-5 Wright Whirlwind. Cape May had one amphibian and one Vought. Receipts in general amounted to \$1,500 per month, but very little was paid in 1932. And the plane was not paid the most efficient coast boat charter in the business.

[illegible]

From there on the curve of progress
 glides like a soaring balloon. Today
 there are complete All Stations at



Capt. Lloyd Seelbach, Chief, WCCO. He says the new CQ system has spent 11 years in the service, but of them in the Spring branch.

eight points. The old Gloucester station has been moved to Salem. Other former locations are Floyd Bennett Field, Long Island, Charles, S. C.; Miami and St. Petersburg, Fla.; Wilson, Miss.; San Diego, Cal.; and Fort Angeles, Wash. Cape May is now designated as an Air Patrol Detachment and there is another such Detachment at El Paso, Texas. In addition there are Aviation Device places marked aboard Coast Guard cutters based in Honolulu, in Cordoba, Alaska, and in Norfolk, Va.

The original handful of pilots and mechanics has swollen to a personnel roster of 400 men—42 are officers; 19 warrant officers; 19 are enlisted men designated as aviation pilots. The remaining are enlisted men of various ratings.

For the year ending June 30, 1997 Coast Guard planes flew 780,545 miles logging over 9,000 hours in the process. There are now 46 planes in service and ten more are due for delivery in coming months. Besides the 19 patrol boats, 45 officers are designated as full Coast Guard Aviators.

The Coast Guard sets still requirements for its equipment. Here are some classes covered all items for listed things: (1) The Eternity (2) The Wave (3) The Lighthouse (4) The Tenthredin. The shipboard service with Coast Guard crew (5) The last Coast Guard (6). For short water points along the Eastern coast (7) The Viking shipbuilding. Wright Park and Whiskey Spreading and Knappe system all listed (8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 82

Personal

And I don't even have the faintest notion of staging a pair of Coast Guard wings a microsecond below the ledge on the cheek of a Naval Air Corps fleet officer. I'm a graduate from a staff boat crew course at the Coast Guard Academy in New London, Conn. They spend three years at sea in the Coast Guard cutter, and then they go to the Naval Right-About-Face course at Parris, Ala. After that subject is needed checking out in each service type and following in extra course in instrument flying and with dual class in the simulator. I'm not a pilot, but my instrument and engine practice you are (properly) considered in the Coast Guard equipment. Your officer's title, and incidentally your pay will correspond, probably with that of a naval officer grade in the Naval Service.

Enlistees, please also take the training at Pensacola—but only after substantial and outstanding service in the Coast Guard. The careers of other ratings are exclusively within the Guard. Machinists, Minors are trained at the Coast Guard Engine School and Repair Base at Norfolk. Boiler men are trained at New London. Applicants for both specialties are drawn from persons-integrated within the service.

The complement of a typical workstation amounts to: A commanding of-

Four holding the rank of Lieutenant, LAFB/AFSCM Commander or Colonel, and four Aviators: usually two Liaison Officers, two Warrent Officers, two qualified Aviators, Pilot, a Chief, Reservist's Mate, Crew Chief, Aviator, Marksmen's Mate and a Chief Carpenter's Mate. A Chief Radioman and a First Class Radioman qualified for another duty. A Pharmacist Mate and two Yeomen. Seven spouses and two cadets. In addition, and depending upon the number and type of phones at the station, there are a dozen or so more men with various auxiliary assignments and four Radiomen.

Above the commanding officers at the air stations is the Chief of the Aviation Division, directing and operating through officers in charge of an Operations Section, a Material Section and a Finance Section. Above the Chief of the Aviation Division is the Commandant of the Coast Guard. In all very simple and efficient-making

Operations

There is a widespread misconception held by most women that Coast Guard flying consists largely of empty. The patrol jumps up and down five feet—no doubt planned and well-timed in good weather but perfect with wild and woolly chases taken when the winds come down. Nothing is further from the truth.

Actually the C.G. does make a few other points that might be called "prophylactic" (Turn is true 58)



Over time, techniques have always shifted along the value ladder in some way, although ultimately the net result often

See also regular Akashi-Itada experiment on page III for a complete treatment of East Coast railro.





AVIATION'S youth were a center of attention. The model airplanes and the model airplanes were in evidence all around the youth.

AVIATION

Goes to

the Show

One of the youth pilots and the other pilots of the youth program.



When the Second World War broke out, the youth program was started on April 12. The management estimated that total attendance was about one-third greater than for 1937. The youth exhibit, however, occupied a small hall in the total space. Our model airplane was caught a few short personalizations in the hallway.



J. W. Green of Cleveland, Tenn., and Paul, Harry B. Watson of Seattle, discuss the youth program and future of the youth show.

Mr. and Mrs. G. G. Taylor of Dayton, Ohio, were seated in the Tennessee exhibit.



Walter Linder of Garden of the Gods, Colo., gave a personal address at a meeting of the youth program in the youth exhibit of the N.A.A.



H. E. Dole of San Francisco, with the youth exhibit.



Thomas A. Wootley of the Frank Wootley Train School.



M. E. Swanson, M. M. Felt, and others, with the youth exhibit.



Arthur Munkley, designer, and E. Hines, with the youth exhibit.



E. J. Lynch of Fresno, Wash., with the youth exhibit.



Robert Martin of Seattle, Wash., with the youth exhibit.



Robert Martin of Seattle, Wash., with the youth exhibit.



William J. Carr of Seattle, with the youth exhibit.



Paul A. Tipton and a group of youth pilots in the youth exhibit.



Carl de Groot of the youth exhibit, with the youth exhibit.



THE YOUTH EXHIBIT (OPPOSITE) had an excellent center just prior to the Alaska and Bore Show. Several exhibits of the youth exhibit.

Several exhibits of the youth exhibit, including the youth exhibit, with the youth exhibit.



DUCKING

the Divorce

Substituting flying clubs for bridge clubs should bring about a new era of domestic tranquility.

By Nancy Swartz

DIANE HENSON "What have you done with the old family bridge table, dear?"

THOM HENSON "I threw it out yesterday morning."

DIANE HENSON "Thank the Lord, but what of the Monday, Tuesday, Thursday and Friday Bridge Club?"

THOM HENSON "We have disbanded to form a Flying Club, meeting twice a week at the airport."

DIANE HENSON "Fine. That should enable me to resume my flying. I gave it up when I married you."

DIANE HENSON "By all means, and now both of us can fly independently in light airplanes under the club plan."

Thus tranquility stalked another divorce lawyer.

Many a man courageous enough to leave the club without flying has not been sufficiently brave to continue his flying in spite of the criticism of his varied young folk. A small percentage go back to fly as when romance still has most of them here because so preoccupied with the empty rumble of bridge and cocktails that they are forever enthralled. It is only by adding the younger generation of women, both married and unmarried, on the safety and availability of low cost flying time and airplane ownership that the volume private airplane market will ever develop because the wife or sweetheart is frequently the most important element of sales resistance to be met.

Few of us who have not been in direct contact with airplane programs realize how little the average man or woman knows about flying. There is a tremendous educational job to be

done before they will come, in numbers that they can learn to fly as cheaply as they indulge in the leisuretime activities in which they now indulge. And few realize that there is an inexpensive yet exhilarating activity for them which the other members of their family can share.

With this idea in mind W. T. Pope, of Pope Aircraft, inaugurated a novel experiment at the Lock Haven plant. Several girls, invited by the distributors in widely separated sections of the country for experiments and interest in aviation, were sent to work in the manufacturing departments of the plant. The idea was for them to develop an interest with their own inclination. This specific idea would sell their fellow-workers on the safety and economy of flying. Starting in the evening and during department, we learned all the various operations.

We attended morning classes in the evening, studied up flying time during our spare moments and such ends, and spent some time on each of the departments—first metal, riveting, rigging, and final assembly.

First of the group to find a place in the picture was Miss Jean Heflin from Spokane, Washington, who has become an assistant to the promotion manager, where with the 10 flying women of all the world the time, when and why of light aircraft flying. Her job is convincing organizations and clubs, educators and recreation directors, individuals and groups, writing articles for publications, distributing open club plans, analyzing new interests, ways and means of finding and organizing where possible a business appeal into the advertising program. When another says "My partner

Court



The author as she appeared at 40 Kew-Forest's exhibit at the Sportman's Show in New York.



Top—Miss Jean Heflin, Spokane, who took a place for herself in the promotion department. Right—Miss Sally Ann Austin, who made the rounds of the Pope production departments.

and mutual dislikes are a perfect excuse for her money work. She wants to go back to Texas and restart all the babies of the Pope not to question some of the men and boys.

My first opportunity to hold work came when Vi Al. Barrett, an outstanding distributor, attended for me to take charge of the Club exhibit at the Sportman's Show in New York City. This was a new and very successful venture which contacted a definite audience. Six weeks after the exhibit program, are showing 60,000 visitors from New York to Highstown, N. J., to learn more about the

state they live in at the show. The sportman looking for target most increases relaxation and relaxation finds aviation fits it well with his present hobby. Then, too, the idea was introduced to the sponsors and promoters of sports activities many of whom will send thousands of this added attraction. Some hope to use the plane for sporting activities, others as a means of recreation, and yet others to fly directly from the shop to the state.

Our experiment has only started but the results so far are sufficiently promising to provide food for thought for other manufacturers and distributors of private aircraft. And we feel that the day is not far distant when many of the babies of our land will locate their bridge tables for flying clubs and bring about a new era of domestic tranquility.

How much is 100 OCTANE

WORTH?

Higher grades of aviation fuels hold out prospects for better engine performance. Abstracts from three papers read before the Airline Maintenance Conference at Dallas.

SINCE OPERATING PERFORMANCE, EFFICIENCY, AND ENDURANCE GOES IN particular, have more than passing interest in the effects on these aspects of the higher octane fuels, shortly to be generally available, can whole status of the next meeting of the Airline Maintenance Conference was devoted to the discussion of 100 octane gasoline. Most everyone was of the fact that a group of outstanding fuel technicians attended the meeting, and there, J. H. Dandridge of Shell, W. H. Hubert of Universal Oil Products Co., and S. D. Himes of the Ethyl Gas Corporation, made the crux of their own experience available to the others by means of prepared papers and informal discussion. It is to be regretted that space limitations make impossible the complete presentation of all three papers here. Still, they have an effect here made to abstract the complete content of any of them, but before any operations in aviation carrying specific points that seemed of importance to operating people.

James Dandridge started the ball rolling with a nonconformative paper on the whole fuel problem with particular reference to 100 octane. He tried the desirable characteristics of any aviation gasoline as follows:

- (a) High antiknock value. Freedom from tendency to detonate.
- (b) High heat value. More miles per pound and per gallon, in well.
- (c) Low oil consumption.
- (d) High volatility. Good distribution and no excessive deposits.
- (e) Temperature stability. The pilot should retain his knock rating under "normal" or, in high temperatures and pressures, in the region.
- (f) High lead availability. In order to maintain the lead required it is desirable that a small amount should come

a large increase in the knock rating.

- (a) Temperature. It should not rise more than 10° in more demanding delivery systems, when it jumped into the bottom of the crank tank and the pressure is forced out at the top. It is also possible that if a fuel which jumped up would become stabilized with a 4° change in temperature might cause the water to separate out at the tank base, or coarsen.
- (b) Low vapor pressure. The pressure should not tend to expand and form vapor bubbles in the gasoline line.
- (c) Stability in storage. It should not form gum or low antiknock value, even after prolonged storage.

- (d) Freedom from rain. Gum tends to stick pipes and valves.
- (e) Low lubricity content. Sulfur tends toward corrosion but also reduction of lead susceptibility.
- (f) Consistency. It should be free from water, dirt, and other impurities.
- (g) Flammability.

Some high octane blending compounds, he pointed out, also have the desirable characteristics of stabilizing combustion, such as of removing no such a fat deposit.

One blended octane fuel is designed to meet the same specifications as the 87 octane gasoline now used by most airlines, except that it contains a higher percentage of hydrocarbons at a stable knock rating. The lead content is actually lower than most other fuels, is constant only 3 or 4 octane, and is 87 octane. The 87 octane fuel is also used for the regular Avco 92 octane grade.

Generally speaking, 100 octane fuel is expected to drop appreciably for its use, will permit about 25 per cent increase in power or about 12 per cent reduction in specific fuel consumption. The attempt was made to

point out the savings in operating costs that might be allowed through such savings, but, said Dandridge, "as testing is carried to the fact that 100 gallons of gasoline will burn a normal full load load of a DC-3 on D-57, weight 4,800 pounds. Twelve per cent of 4,800 pounds is 576 pounds. The value, in dollars, of a pound saved in weight over the actual 516 of an airplane has been variously set from \$10 to \$2.50. The first figure represents a fine penalty for over-weight and the second in the rough figure arrived at by calculating the savings power at 10) cents per mile on 200 lbs. at 200 mph on the basis of 2,000 hrs. per year over a period of five years, actually 375 x \$10 is only \$3,750 saved over the 516 of the airplane, but 576 x \$2.50 is over \$1,440,000. This amount would not be earned in practice because it pre-supposes full load operation, at all times, with the best paying load. A large part of it may be realized, however, and furthermore we would point out that we have considered the saving in fuel weight only and have not taken into consideration the important item of increased performance due to reduced internal area and reduced weight on the smaller, more powerful 100 octane engines. The additional cost in 3 cents per gallon premium, for 100 octane fuel, over the period at 96 gallons per hour, is 3 cents x 90 x 2,000 (hours) or \$54,000. This would offset of the potential \$1,250,000 savings, less than 4 per cent, at first glance, at 200 mph at 150 per per engine, the saving on 87 octane, taking a specific fuel consumption of 43.5 lbs. per

hp-hr is $\frac{4800 \times 200}{1100 \times 43} = 2000$ miles

At 200 hp per hp-hr, using 100 octane fuel, the range would be 2,500 miles.

"At this time it should be pointed out that in high output engines near 100 octane fuel, the critical combustion of the fuel will occur at late mixture timing and not during take-off. This means that in the opinion of the future only one fuel will be used, and not a high octane fuel for take-off and a lower octane fuel for cruising. This tendency is already indicated in the most modern engines in use today.

"Detonation, unlike pre-ignition, which is the result of a mostly early ignition and is followed by normal burning, is a phenomenon in which the flame propagation, either on a single flame front or a multiple flame front, is about ten times as fast as under normal combustion. Detonation is accompanied by extremely high temperatures and pressures, and is sufficiently severe, or if allowed to continue for a long enough time, will prove destructive to the engine. The first part to fail is, ordinarily, the piston, although the cylinder and, in high output engines, the spark plug, valve, and even the connecting rods and bearings may suffer."

Heretofore, in discussing the effect of engine material on performance, said "The recent bulletin of the Department of Commerce (Air Commerce Bulletin TM 624, November 15, 1937) concerning the lamprosy of propellers for take-off at large airports shortly to be ready for service has emphasized the importance of take-off characteristics. One large and experienced operator has indicated that a 20 per cent increase of take-off power reduces the length of the take-off run by 45 per cent in the case of large multi-engine airplanes. This is equivalent to reducing the necessary landing area by 70 per cent in the case of rectangular and geometrically similar airports. It is the experience of this speaker that the use of 100 octane fuel (Army Method) in place of 87 octane material (A.S.T.M.) increases the permissible take-off power by 25 per cent."

"Kins" ("Future Possibilities of 100 Octane Aviation Engines Fuel") F. D. Bous-S.A.E. Transactions, 30-3 (1935) and Young ("Estimated Fuel-Air Ratio") S.A.E. Transactions, Performance Publications.

Raymond W. Young-S.A.E. Transactions, 30-6 (1935) has shown that the use of 100 octane fuel in place of 87 octane material would possibly 15 or more per cent reduction in specific fuel consumption at cruising output. Young

has shown that a cruising consumption of 35 lb per hp-hr can be obtained on a 400-hp engine with a large aircooled engine having a compression ratio of approximately 15 to 1 by very careful mixture control. Young pointed out that the most serious economy in obtaining such consumption is right now not that available. Young's figures have been the subject of considerable discussion, particularly in Europe, his explanation on the fact that such consumption were not available is flight being nearly discarded.

The author is in a position to know that endurance running at a specific fuel consumption of less than 4 lb per hp-hr has been carried out on modern American aircooled engines in Europe, his explanation on the fact that such consumption were not available is flight being nearly discarded.

"MacClain and Buck ("Flight Testing with an Engine Test Inductor") A. Lewis MacClain and Richard S. Buck-S.A.E. Transactions, 43-2 (1938) have recently described a device for the measurement of horsepower in flight. This instrument only adds about 20 lb to the weight of the engine and its operation in flight is simple. Fuel flow meters which give reasonably accurate and simple measurement of fuel flow in flight are available. The use of the torque meter in conjunction with fuel flow meters makes it possible to more closely approach the best dynamic cruising consumption in flight than has formerly been the case. (Indicated horsepower) MacClain and Buck have indicated that consumption of slightly less than 4 lb per hp-hr during flight tests were the engine required. This was obtained with an engine test unit specially designed for low cruising fuel consumption.

Maclain ("Airframe Power Plant Trends") Aeronautical Power Plant S.A.E. Transactions, 43-4 (1937) has pointed out that extremely low specific aviation fuel consumption are likely to be obtained in new grades of engine weight to secure the required durability. The weight increase likely to be necessary, however, will probably be more than in comparison with the saving in total fuel load resulting from increased economy provided."

Clearly added to the subject is the problem of fuel in place of 87 octane material would possibly 15 or more per cent reduction in specific fuel consumption at cruising output. Young

plan for standardization to reduce the amount of grades of fuel required for aviation. This is in part:

"The principal difference between the various grades of aviation fuel is anti-knock value. Based on available data, it is estimated that 14 different anti-knock classifications in the United States and 17 in foreign countries, these range from 85 to 100 octane number."

"These test methods are in use for determining these octane numbers, namely: (1) Army Air Corps; (2) ASTM-CFR motor; and (3) modified method."

"In the United States, the standard ASTM-CFR motor method is specified by all engine manufacturers and commercial airlines and also by the Navy Bureau of Aeronautics in all except at 100 octane grade. The Army method is used in all specifications on the Army Air Corps and in the Navy's 100 octane grade."

The modified motor method is used only by the British Air Ministry, British engine manufacturers, and Imperial Airways (England). The 100 octane grade is used by the Air Ministry and British engine manufacturers is one exception, in which case the standard ASTM-CFR motor method is specified. The Air Ministry, engine manufacturers, and commercial airlines of other foreign countries also specify the standard motor method."

"It is emphasized that these methods exist for testing aircraft fuels. However, the extensive work now being carried out in the United States by the Aviation Fuel Section of the Air Corps, and the work now being carried out in Europe should soon result in a solution to the problem. This work is being conducted in a manner which will result in the standardization of several approved CFR engines. Similar work in Europe should be of added value in establishing a standard method for testing aircraft fuels."

"When this standardization has been accomplished, it is hoped that the various aviation writing specifications will conform to the standard grades of aviation fuel. Even with two test methods in use in the United States, it is sufficient justification for the action taken. 14 different grades, i.e., 85, 85.75, 86, 86.25, 86.5, 86.75, 87, 87.25, 87.5, 87.75, 88, 88.25, 88.5, 88.75, 89, 89.25, 89.5, 89.75, 90, 90.25, 90.5, 90.75, 91, 91.25, 91.5, 91.75, 92, 92.25, 92.5, 92.75, 93, 93.25, 93.5, 93.75, 94, 94.25, 94.5, 94.75, 95, 95.25, 95.5, 95.75, 96, 96.25, 96.5, 96.75, 97, 97.25, 97.5, 97.75, 98, 98.25, 98.5, 98.75, 99, 99.25, 99.5, 99.75, 100 octane number."

[A sub-committee of the AITA membership is now at work on work with aircraft producers of aviation fuels to materially reduce the number of fuel specifications.] The Editor



VULTEE EXPANDS

The success of the V-11 airplane in foreign markets has forced the Vultee Aircraft Division of Aviatron Manufacturing Corporation to make extensive additions to the original plant at Downey, Calif. In the photograph on the left the original buildings and the new additions can be clearly distinguished.



Parking V-11s for shipment to Turkey. Engines and equipment in the hangars are protected with automatic gasolene blanket coverings.



Function sections are made up of 100 standard sheets that allowed to drop, transport and handle them.



Wings joined to fuselage sections and fuselage sections joined. The fuselage sections are joined to the fuselage sections.

Three large, wall-hung pictures show in which V-11s are shipped with fuselage and fuselage sections.



Final fuselage assembly line showing fuselage sections and fuselage sections joined. The fuselage sections are joined to the fuselage sections.



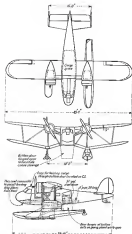
From fuselage assembly line the fuselage sections are joined to the fuselage sections. The fuselage sections are joined to the fuselage sections.





FLEET Freighter

Cargo carrier exhibits has 380 sq. ft. of floor space, ample cargo doors and can be operated on wheels, floats or skis.



Designers to meet the existing requirements of air transport in Canada, the new Fleet Freighter will handle passengers, freight and express equally well on wheels, floats or skis. Throughout the design simplicity, ruggedness and ease of maintenance have been given paramount attention. Also given prime consideration have been the adaptability of the freighter design to varying types of loads, and the ability of the airplane to get in and out of difficult fields, and to be dismantled quickly. The extra space of 350 cubic feet provides ample room for 12 to 14 passenger seats if required. Primary attention, however, has been given to facilities for loading and unloading the express cargo which is used in Northern Canada. Freight handling by air includes every conceivable commodity pertaining to house-keeping, machinery, drilling, mining,

logically, etc. Quite often it is necessary to carry large units of machinery which have to be cut apart with a gas torch and later welded together. Length of page 3 is three-view and 26 ft. long, 50 ft. steel-rod

frame, complete spare engines, etc., are commonly carried. Horses and auto axle frequently transported, and during the winter many freight planes are used to haul loads of fish from northern lakes to the rail heads.



AVIATION
May, 1934
14

To handle such varying loads the Fleet Freighter features a large side door at the rear, which hinges at the bottom to form a gang plank when lowered, and a large freight hatch to the floor of the forward end of the cabin.

The plane is of steel-braced biplane typepowered with two Jacobs L-5 engines of 285-300 hp. each. Engines are mounted in the top wing outer section. A full wing effect on the lower wing outer section panel provides a direct mounting for dual to wing fittings, without use of struts. Monoco construction is used throughout the plane, with welded steel fuselage structure and fabric covering throughout. Fundamental in the development of the Fleet Freighter is attention to Jack Sanderson, president of Fleet Aircraft, Limited, who sponsored the design and made first flight tests were: R. E. Young, chief engineer, Joe Gowan, Jr., consulting engineer, T. McCracken, factory manager, and Al Jacobs, of the Jacobs Engine Company.

Specifications supplied by the manufacturer are as follows:

Span..... 46 ft.
Length..... 32 ft. 30 in.
Wingspan..... 15 ft. 1 in.
Wing area..... 526 sq. ft.
Wing loading..... 15.14 lb. per sq. ft.
Power loading..... 13.34 hp. per hp.
Period..... 3000 ft. (with fuel for 300 mi. range)
Gross weight..... 3500 lb.
Engines..... two Jacobs L-5, 285-300 hp. each
Propellers..... Curtiss Reed 190 in. diameter
Top speed..... 170 mph.



Left to Right: Ray Brown, President, Wings Ltd.; T. McCracken, factory manager, W. J. Sanderson, president, and S. E. Young, chief engineer, Fleet Aircraft Ltd.



A complete Jacobs engine can be lowered by the forward hatch.



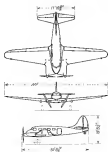
A standard door can be rolled through the rear cargo door.

Access to top of fuselage is provided by a chute built in top of fuselage.



ALCOR C-6-1 Junior Transport

The Alcor C-6-1 Junior Transport two-engine light plane introduced by the Alcor Aircraft Corporation of Oakland, Calif., is unique in loading design trends both forward and backward at the same time. Future possibilities in engine placement are indicated by the manner in which the Mustang engines with which the Alcor is powered are laid flat so as to



Allen Lockhead experimented with the side-by-side engine "Olympic Duo" in 1933. The 1931 version embodies the same idea but has been re-engineered from nose to tail.

tail into the wing and fuselage, a long step towards the ideal of complete enclosure of powerplants within wing or fuselage. At the same time it may be significant to note the use of wood throughout the main structure of the Alcor. This coincides with similar application of wood structures in other recent light transports such as the Trim and Bonair (Vance Bennett) two-engine planes. It seems probable that some designers may turn back to the use of wood for the structural requirements of planes of medium size.

However, the Alcor is not built entirely of wood, being of composite construction. The entire structure forward of the front wing spar is all welded steel tubing, including the engine mount, landing gear and fittings, and structure of the pilot cockpit. The portion of the plane is covered with sheet steel in girth-reinforced panels, the accessibility of engine, controls, instruments, etc. Breakdown of the plane is of wood construction throughout, but is covered with fabric before being repainted an extremely smooth and durable finish.

In general design the Alcor Junior

Transport is a low wing monoplane with full conventional wing and tail surfaces. Landing gear extends fully into the wing. Accommodations are provided for two pilots and six passengers. Chief feature of the plane is the flat mounting of the Mustang engines, cylinders being directed forward to produce a compact and accessible two engine power section extending flat across the nose of the plane and fitting smoothly into the wing. Several advantages are claimed for this method of mounting the engines, the addition to the stream aerodynamic improvement achieved through placing the powerplant almost entirely within the wing and fuselage. Propellers are brought quite close together, by drawing them right under the engine, and clearance from the nose of the fuselage engines is reduced. This arrangement greatly improves single engine performance and it is claimed that the plane will fly "hands off" with other engines stopped. A feature of the mounting is that with the engines landed in a single row, lateral vibration is confined out by a narrow torque arm which extends across both engines. Couling is brought under easy control by means

of a straight coupling flap across the bottom of the cooling air exhaust slot. This flap is easily adjustable to vary the exhaust opening without the complexity of the cooling flaps now commonly used on radial engine coolings. It is also said that mounting of both engines in the nose of the fuselage greatly simplifies construction of controls and instruments. While the flat "banisterboard" nose is recommended as appropriate, it provides the pilot with unobstructed forward and rearward as compared with conventional nose-engine planes.

Wings are of two spar space construction with three-way covering. The fuselage, aft of the pilot

cockpit, is of monocoque structure with two-way sheet covering. Flaps, ailerons and several stabilizers are also of two spar construction. Laminated spruce with plywood covering is used for the structure of elevator, rudder, ailerons and flaps. Hydraulic controls are used for operating the trailing edge type flaps, and for the retractable landing wheels, which swing up and back to a position flat in the wing, completely retracted. Blanton Standard Constant speed propellers are standard equipment, as is two-way radio.

Designed by Allen Lockhead, president of the Alcor Aircraft Corporation, the Alcor was first flown by

Edmond T. Allen. An extensive program of flight testing is now in progress, demonstrating desirable flight characteristics as well as relatively high performance. A11 hinges, torque tubes, and control galleries in the plane are mounted on ball bearings. Mustang bearings are provided throughout the plane at all heavily stressed joints and fitting assemblies. Bulk supports and the instrument board are mounted on lead rubber bearings. Cabin windows are of Plexiglas and windshield of Taylor. A windshield all of the passenger entry screen a well equipped lavatory and 24 cu. ft. of baggage space. Specifications and performance figures are supplied by the manufacturer below.

Span..... 40 ft.
Wing chord..... 21 ft. 8 in.
Height overall..... 9 ft.
Landing gear track..... 32 ft. 2 in.
Wing area..... 316 sq. ft.
Empty weight..... 4141 lb.
Gross weight..... 5250 lb.
Gross weight..... 6200 lb.
Wing loading..... 113 lb. per sq. ft.
Power loading..... 22.4 hp. per hp. 65,000 h.p.
65,000 h.p. 65,000 h.p.
Power..... 1000 C-6-4 6 cylinder is
low speed engines rated at 260
h.p. each and mounted horizontally.
S.E.C. (S.E.C.)..... 130 mph. at 10,000 ft.
S.E.C. (S.E.C.)..... 140 mph. S.E.C. 120
propeller..... 120 mph. Standard
constant speed type
maximum speed at level..... 211 mph.
75% power..... 110 mph.
maximum speed at 5000 ft.
75% power..... 211 mph.
75% power..... 190 mph.
cruising speed at 3000 ft.
75% power..... 200 mph.
maximum climb rate at 2500 ft.
75% power..... 1200 ft. per min.
Cruising range 65-815 mi. staying with
average fuel
altitude ceiling..... 24000 ft.
fuel's engine performance
100% power..... 147 mph.
cruising speed..... 120 mph.
range 500-640 miles cruising with
average fuel
altitude ceiling..... 300 ft. per min.
12400 ft.



Aircraft manufacturer is experienced in the market and the STINSON 10-C has been in service since 1935. It is a four-engine aircraft with a maximum speed of 200 miles per hour. It is a four-engine aircraft with a maximum speed of 200 miles per hour. It is a four-engine aircraft with a maximum speed of 200 miles per hour.

STINSON SR 10-C

1935 Release is available with six engine installations

covering windshield, upper deck across the top of the fuselage and the lower deck proper. Landing speed and stall speed have been reduced, take-off has been improved and pay load has been increased by a net of 40 pounds.

The engine and engine is at top and bottom and lower than the hood of an automobile, so that it is not necessary to remove it in order to service the motor. Cowling is removed only when a complete motor overhaul becomes necessary. Additional space has been made available in the motor compartment to facilitate inspection.

The instrument panel has been redesigned so as to make possible the grouping of all instruments directly in front of the pilot. The flight instrument panel is also designed so as to make possible easier servicing and inspection of instruments.

The motor mounts and transmission are placed in such a way that they are not in the way of the engine and are far more accessible. They may also be removed as a unit for inspection.

Goodrich-Falmers hydraulic brakes which require no adjustment are now used.

The stroke of the spring-hydraulic shock absorbers has been increased two inches, making the landing shock much softer and leaving far smoother. Flaps are the trailing type and are actuated by vacuum.

The new windshield gives approximately 25 per cent increased vision when taxiing, plus additional vision in flight.

Cabin seats have been relocated to provide greater space between the seats in order to make it easier to enter the plane. The rear or outside baggage compartment has been enlarged 25 per cent. The battery has been relocated, is now in the rear baggage compartment where it is more easily reached for servicing.



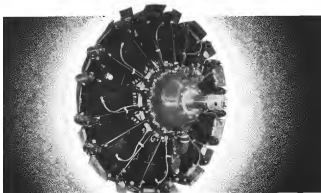
Along left—Pilot's seat through the windshield. Along right—Co-pilot is kept at top. 1 Automatic valve lubrication. 2 Engine valve compartment. Below—Completely wide head landing gear.



AVIATION
May 1935
43

The G 100 WRIGHT CYCLONE

Now Released FOR EXPORT SALE



THE ENGINE *Proved* BY EXPERIENCE ON MAJOR AIRLINES

Tested and proved by many months of operating experience on major airlines, the G-100 Wright Cyclone is now released for export sale.

Flying day after day, winter and summer—many millions of miles each year—airline service is the most grueling test of strength and reliability for an aircraft engine. Now used by Transcontinental and Western Air, Pan American Airways, Pan American Grace Airways, and American Airlines, this seasoned engine was recently placed in service on K.L.M. (Royal Dutch Air Lines).

The G-100 Wright Cyclone is the latest member of the famous Cyclone family of 9-cylinder radial, air-cooled engines that have won the distinction of world-wide acceptance.

The G-100 Wright Cyclone is the latest member of the famous Cyclone family of 9-cylinder radial, air-cooled engines that have won the distinction of world-wide acceptance.

"Fly with Wright the World Over"



WRIGHT
AERONAUTICAL CORPORATION
PATTERSON NEW JERSEY
a division of THE WRIGHT BROTHERS COMPANY





The Birdmen's Perch

FLASH! At last, a Birdman's Perch Whopper Club! Now members are restricted to 3 men only, whose whoppers are printed on GULF AVIATION CARDS, are judged most authentic, and are printed on this page. Certificates of membership (see below), photographed and individually printed with illustration of the member's own particular whopper. Send your card now!

MAIRIE AL WILLIAMS alias "Turret You Two," Mr. Gull
Brenton Way, Gulf Stream Frigate, Gulf Bldg., Phoenix, Ar.

HOW ABOUT MOOSE?

Dear F.W.T.—In reference to your almost building with tools to the world now. You might tell L.C. that hereafter in the Texas Postoffice I surely know how to use axes for wood-saws. Then he knows that Buntz is just the opposite from once! That they are really head on the wall!

—H. Christopher T.W.A.

WHOPPER CLUB



Of special interest to those who wish to be one of the "birds" in the "club" is the award of membership in this club, we announce the charter member of the Birdman's Perch Whopper Club—Captain J. C. Adams of Port Lavaca, N. D.

We have mailed the Captain his duly awarded Certificate of Membership, embellished with his whopper—the illustration of his whopper published last month. He may hang it wherever he wishes, or he can just use it as that old trunk again. We don't care. But we were here, these certificates are now

Member No. 2 is Lawrence Parkman of the Texas Service at Longport. His certificate, illustrated with Col. O. U. Dope on the flying gas tank, will be mailed.

An explained show, one of these handsome documents will be awarded every month. Who's the next member?

BUGHOUSE TRAVEL

Try this problem: Is a sample, and yet one out of ten people, such things as alcohol, give the money market?

There is a two-way, it has, no-stop service between New York and San Francisco, planes leaving every hour, on the hour. Now, including the place that is feeding as we take off from New York,



"He was headed toward Australia at a terrific rate."

and the place that is taking off as we arrive in San Francisco, how many planes do we pass on route?

(Send your answer to F.W.T. (to Mr. Gull) per where you see in this page—we are.)

MAJOR OPERATION



Honest, a stick person couldn't think out an ailing pair of toothy any more than Gull's famous Alkali Point yard can the "old" business of airplane and for the Alkali Point takes already called, 100% Pennsylvania oil and better reasons, literally, as much as 32% new motor power, engine and fuel.

That's why Gulf-Bldg. Co. Alkali Point, as the world's finest oil for planes.

THIS MONTH'S WHOPPER

Dear Mr. F.W.T.—it would occur to this except that the money's office is closed, and anyway it would cost me two bits.

It all started when Colonel O. U. Dope and I decided to develop a fully retractable airplane and prove that, although an aircraft leading gear is fine, there is no more drag caused by the wings, tail, etc., and that they should also be retracted.

We met with some difficulty trying to

decide whether to retract the wings into the fuselage, or the fuselage into the wings, as both were to be retracted. However, this was worked out along with other details, such as housing a place to retract the motor and prop when the rest of the plane was in an extended position.

Came the final test when the entire plane was to be retracted! After filling the tank under the seat with five gallons of Gulf Aviation Gasoline the Colored tank off to make history. At a thousand feet he began retracting the new ship: wings—motor—tail—and finally the fuselage! Thus there was a dash of hope, a cloud of smoke! Well, today the last I saw of Colonel Dope, he was sitting upright, his five gallon tank of Gulf Aviation Gasoline having retracted at a terrific rate.

—Lawrence Parkman, Longport, Colorado

P.B.—The Colonel writes that upon arriving at Australia he had to draw out the remaining four gallons of gas and stretch that tank over the land with a hoisting, to prevent it returning home without loss.

Gulf Oil Corporation and Gulf Refining Company, Inc., makers of

GULF GULF AVIATION PRODUCTS

AERONCA "50" Airplanes

New series uses Continental or Menasco 30 Hp. engine

FOR many years to be approved under the new Civil Air Regulations is the Aeronca "50" series, powered with the recently developed Continental 30 hp. or the new Menasco 30.50 hp. The Aeronca "50" is designed especially for those two new engines. The new series airplanes do not replace the present line of 40 and 45 horsepower planes manufactured by the company. The Menasco-powered plane is designated as the Aeronca "KMF". The Continental-powered ship is the "KCC".

Four improvements to the rear of other and three, longer and stiffer, are used in the fuselage structure. Chromo-molybdenum steel tubing is used in the primary structural members of the fuselage. The engine mount is detachable and has master controls at the point where the engine is attached. Wings and tail section are of conventional construction.

The cockpit system is designed to minimize friction wherever possible. Sprocket gears in the control columns are mounted in double roller bearings. The sprag gear inverts positive aileron action. The aileron hinges have "Globe" bearing which are permitted with oil to insure smooth free action for the life of the bearing. The aluminum alloy framework of the aileron is fully covered and is the very efficient fence type which gives greater response to the wheel and simple lateral control.

The new also landing gear utilizes the old to absorb the shock of landing and to allow the wheel of the spring and piston as the wheel returns to normal position. Thus the oleo gear gives dual action which greatly in landing and taking off in rough field. The tread is 70 inches and the track is made the plane very stable even in a cross wind. This gear is easily equipped with brakes, which are operated individually by foot pedals on the rudder pedals. The ship is equipped with other dual as well as KCA specifications and performance figures are as follows:

Wing span 26' 0"
Length 20' 0"

Height	6' 7"
Empty weight—gross	550
Gas (10 gallons)—payload	50
Oil (4 quarts)—payload	116
Fuel—payload	170
Passenger—payload	170
Baggage—payload	40
Maximum Equipment	22.5
Useful load—payload	480
Gross weight—payload	1,130
Wing loading—payload	5.08
Power loading—payload, per H.P.	22.6
Performance:	
High speed	100 m.p.h.
Cruising speed	90 m.p.h.
Landing speed	30 m.p.h.
Rate of climb	200 ft. per min.
Glide angle	16 to 1
Turner	14,000
Cruising range	200 miles



Control wheel and instrument panel installed below modern design profile



AVIATION
May 1937

DART Model G

Two plane monoplane powered with Lambert Engine



MANUFACTURE of the Dart Model G is now under way in the Dart Manufacturing Corp. plant at Columbus, Ohio. This plane was originally developed by the Massachusetts Corp. of Robertson, Mo., manufacturing rights having been sold to Dart.

The model G is a two plane side-by-side low wing extra monoplane of cantilever wing structure, powered with a Lambert R-260 engine of 90 hp. Wings are of two spar wood construction cloth covered. The fuselage is of welded steel tubing, fabric covered on rear of the cabin. Tail surfaces are also of welded tube cantilever construction, fabric covered. Standard equipment includes:

Goodyear Aerobush and Servos, dual controls, wiring for lights, log books, first aid kit, tool box, engine manual for investigation and school, carburetor heat control valve, landing gear, central performance and specifications as supplied by the manufacturer are:

Span	25 ft. 7 in.
Overall length	30 ft. 7 in.
Wing area	341 sq. ft.
Empty weight	1700 lb.
Useful load	640 lb.
Payload	300 lb.
Gross weight	1700 lb.
Maximum speed	112 mph
Cruise speed	112 mph
Landing speed	40 mph
Climbing rate	200 ft.
Service ceiling	14,000 ft.



FULL FEATHERING "hydrofoil" propellers developed by Hamilton Standard are still an Army-Navy secret but are as indicated doubtless are common. They have however been released for commercial use as 40 DPH. Note: these hydrofoils are of the automatic, constant speed variety—may be feathered in any angle of attack in flight for any engine rate

used in 15-20 seconds. The above illustration is on a 281 Douglas Hydrofoil with the best P & W 1800-G Twin Wing engine (2200 hp). See table, record rating 1000 hp at 6,000 ft. **Autopilot** Autopilot has also announced on order for 70 of the new 115 full feathering propellers (300-400) for Hamilton on the Epineuroal Douglas Hydrofoil and Hydrofoil.

AVIATION
May 1940
45

FROM ARCTIC WASTES
* TO THE BLISTERING TROPICS
PBY'S TAKE EVERY ROUTINE
ASSIGNMENT IN STRIDE





Calibrating radio aboard Bader at Cape May

COAST GUARD RADIO

Equipment that must operate when conditions are worst

Editor's Note: As a part of the article describing the aircraft activities of the U. S. Coast Guard, which appears on pages 22 to 23 of this issue, the following description of the Coast Guard aircraft radio facility has been prepared by the radio editor, the representative of the C. F. Solt, Chief Wireless Officer, U. S. Coast Guard, attached to the Coast Guard Aviation, New London, Connecticut, in the preparation of this article is specifically acknowledged.

THE AIRCRAFT RADIO COMMUNICATIONS FACILITIES of the United States Coast Guard since it began an organized branch of that service in 1919, has been distinguished by the extraordinary variety of service required at it under all kinds of routine and adverse emergency conditions.

Range of an emergency nature is frequently done when conditions, both for aeronautical and communication purposes, are at their worst. The radio equipment must be capable not only of communicating with other Coast Guard aircraft, land and ship agencies, but with the Army and Navy and other government services, with the commercial airlines, vessels, coastal stations and airports, and in certain emergencies communication even with the amateur operators may be involved. Consequently the flexibility of frequency range is at unique fac-

By Don Fink

Managing Editor, Electronics

position. Crystal control of frequency is not feasible except on a few permanent Coast Guard assignments. For all other purposes frequency stability must be assured without direct benefit of quartz.

Direction Finders

Since the precise location of shipwrecks and downed is often the object of Coast Guard flights, accurate and dependable direction-finding equipment must be available. The earliest application of direction finders, as will be remembered, was at coastal stations and on ships, and in particular on Coast Guard vessels. Where search facilities were added to the Coast Guard, it was natural that radio direction-finding should be a delivery recognized requirement of the new service. By 1938, the C. G. aircraft changed with research and development work had satisfied themselves, following a period of preliminary investigation, that direction finding equipment was feasible in aircraft, whereupon an extensive development was undertaken. By February, 1939, the first standard model designated as U. S. C. G. Type CGR-15, was put in

service. This marked the initial application of the electromechanically-shielded ("Aerostat") loop direction finder for standard airplane use and was installed and tested on a Coast Guard plane at Cape May, N. J. This original installation is shown in the accompanying photo. The subsequent "discovery" of the shielded loop by the commercial airlines and its adoption by the Bureau of Air Commerce as required equipment, came some five years after the Coast Guard got it in regular service. Prior to its specific application for airplane use the shielded loop had been utilized in Coast Guard marine type direction finders for at least 5 years.

Later experiments with loops indicated that two sizes of different diameters were desirable in order to efficiently cover two separate and separate frequency ranges. A number of the C. G. transport and patrol planes are now equipped with these double loop-type direction finders. The larger loop is used for the low frequency range, from 200 to 750 kc while the smaller covers the 2000 to 5500 kc range. These loops are mounted in removable bearings, so that cross bearings can be taken without changing the direction of flight. The loop of the double loop assembly is about 18 pounds at 250 m.p.h. For the faster ships such as the Grumman amphibians, a serviceable portable loop is

stationary streamlined lifting instead of free-helium is used. It has a drag of only 2 pounds at 200 m.p.h. and a lift from wing struts which is an adverse disadvantage of the open tandem loop.

A later type of search direction finder now in C. G. aircraft is combined with an all-purpose transmitter-receiver and direction-finder. Designed as model T. CGR-40 it is employed on the Grumman patrol amphibians.

This versatile equipment

may be used not only in aircraft but also for emergency and portable operations, mounted on trucks, or set up temporarily at strategic locations on the ground as was the case during flood-relief work in the Ohio and Mississippi floods of 1936. A battery case contains "A" and "B" batteries for emergency reception and transmission. The transmitter normally derives its source of primary power supply from the 12 V d.c. battery system of the aircraft and employs four

type 10 tubes furnishing a maximum output of 15 watts. As emergency services, the type 10 tubes may be replaced with 12-A tubes, thus reducing the battery drain and output power to a value (1 watt) which may be supplied by the emergency battery supply. Operation on cw, mc, or phone is available.

The transmitter, which is of the familiar master-slave-tube, power-amplifier type employs an adjustable impedance-matching network (a stand and yoke is all C. G. transmission) which will match the transmitter output to any type and length of antenna either fixed or sailing.

Calibration of Direction Finders

To obtain the highest possible degree of accuracy, each Coast Guard aircraft direction finder installation is carefully calibrated when installed and at regular intervals thereafter.

The calibration is carried out in the open, free from reflecting objects or obstructions, such as the landing field situated near the service down at Cape May, N. J. A small boat, anchored two miles off shore, contains a transmitter which sends a continuous signal, thereby serving as a calibrating "target." By the use of a goniometer, the true direction from plane to transmitter (range) is obtained, while the indicated bearing is noted with the direction finder. The difference between true and indicated direction is then taken as a correction for each particular heading. The error with which the calibrations are carried out amounts to a degree of accuracy and reliability of the d-f equipment which would not be realized otherwise. The set-up of the plane, tractor and dolly for a typical calibration is shown in the accompanying picture.

Another aerial piece of radio equipment recently developed and now (Turn to page 23)



Shielded receiver transmitter-direction finder used in the Grumman utility amphibians



Radio operator's position in the C. G. Douglas Dolphin transport amphibian



Coast Guard "Dolphin" in 1939 this shielded loop, the first ever installed on an airplane, went into service at Cape May

B G Electrode Former

And adjuster in new servicing tool

7211 BG Electroformer, 136 West 84th Street, New York 19, N. Y., has just announced its new M-482 Electrode Forming and Adjusting Tool. The new tool is designed to provide a uniform clearance between the anode electrode and the ion-pump shell electrodes of BG plugs when adjustments are made in service.

By maintaining a uniform clearance over a large area of the electrode tip, erosion is uniformly distributed and proceeds at a uniform rate. If improperly adjusted, erosion is localized and proceeds rapidly. As a result, the spark plugs must be replaced more frequently for gap adjustment.

A set of five scale discs is provided with the tool to accommodate the complete range of BG spark plugs with four-pole electrodes. For leveling, one of the scale discs is selected for the particular type of shell to be serviced. This disc, used in conjunction with the levelling die, mounted in the lower end of the vertical rack of the tool, properly forms the shell under the impact of a light hammer blow.

After completing the levelling operation, the levelling die is removed from the tool frame and replaced by



Simplest Electrode wind vane

the plug carriage. The spark plug is then assembled and mounted in the plug carriage. After securing the electrode adjusting tool in the lower end of the rack, and locking it in place, the shell electrode is pressed into position by the movement of the lever which lowers the rack. A thickness gauge held between the electrodes during this operation assures the proper gap setting, and, because of the forming operation on the shell electrode, a uniform gap is maintained for the greater portion of the electrode tip.

Advantages of the new tool are: It assures an accurate gap between the center and shell electrodes. Because of the uniform gap extending over a large portion of the anode electrode, most uniform burning occurs and the electrode life is increased. The relatively large area of the electrode tip in close adjustment makes the re-couping for gap adjustment less frequent. The speed of adjustment of electrode gaps is greatly increased over any other method which may be used to adjust BG spark plugs. (Aviation May, 1958.)

Electric Wind Vane

Indicates wind direction day or night

AN ELECTRIC WIND VANE developed by M. C. Stowers of Arlington, Mass., accurately indicates wind direction at a remote control point, day or night. The vane is equipped with electrical contacts for connection by cable to eight separate lights arranged in a dial indicator, each light corresponding to one of the eight points of the compass. One of the lights is lighted at all times, and when the vane is rotating between two points, both lights are lighted, giving instant-point indication. Two or three dials can be connected to the same instrument to give simultaneous readings at several places. Any convenient current source for making it to 5 volts may be used—Aviation May, 1958.

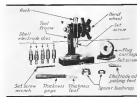


Parts of Goodrich brake

Goodrich Brake

Size range from light planes to Douglas DC-4

The new Goodrich brake which will be standard equipment on the Douglas DC-4 is made in a number of sizes from a 5 in. unit for light airplanes to the 25 in. unit for the new DC-4. It consists of a full ring of brake lining articulated so conform to the requirements of brake drums and expanded also positive by means of an inflated (Time is June 75)



Electroformer tool and equipment

B. A. C. Would Boost Private Flying

(Story on page 43)



ROBERT BAE. The Great Coast rushes work as its new quarters at Floyd Bennett Field, Long Island. Most Coast Guard bases are very old elsewhere. This one, right at New York's biggest airport, should become a sort of Coast Guard showplace.

TALLEST DROP: The French airman, James Williams, will set his record fall-out from JATO 70, which assumes that it particularly multiplies to be a new record.



INDOOR AVIATOR: Harry Belafonte, world's champion biplane pilot, takes the Focke Wulf "Dachau" 40, here in a bit. Then lands gracefully inside Berlin's big Olympiastadion.



Roper Names Mulligan to Fagg Post

New R.A.C. head asserts private flyers in first official moves

IT'S BEEN ALMOST A FULL MONTH since Commerce Secretary Fagg gave the post a handoff to the effect that: (1) Prof. D. Fagg, Jr. would leave the Bureau of Air Commerce April 13 to take up duties as dean of the Northwestern Law School; (2) James Mulligan, one of two Assistant Directors of the Bureau, would succeed Mr. Fagg. For almost a full month, then, the longer Mr. Fagg has been disappearing around the hidden angles.

Fagg's leaving should have caused little surprise. His resignation had been in for months. It was known that Northwestern wanted him to go, as his new job is none too possible. But a number of people had feared the impression that Fagg did not plan to leave until June. Why the upset? Mr. Fagg's appointment should have raised no eyebrows. His strong influence around the Commerce building had been obvious.

Most of the industry who have met the big brother (there) seem to praise the Bureau in 1935 have liked him personally and found him capable, outgoing, and well-informed. After graduating from West Point he passed through Brooks and Kelley, then served as an Army pilot. If there was any wide objection to the new appointee he was based very on the grounds that after leaving the Air Service, Mulligan proceeded to go through a couple of late schools, join her career and go to work as a T-32-director. And there were plenty of longer-often business groups who would not see him month after month, with those C.A.C. and their top type were just what had been the matter with the Bureau.

Mulligan promptly moved into the deserted private flying pavilion with a flag at once. Before he moved into his new office he told an Air Board spokesman in New York that Mulligan planned a survey of the country's airports—to check concrete data and to determine which deserved continued Federal support from point of view of national defense. It is admitted the list of anti-CAR laws registered by private flyers were "well founded in many respects." Already, he pointed out, many reasons for the best compliance had been reached; more would be at the new stage.

Then a few days later came the announcement that the BAC had set up a "Private Flying Section" to be devoted to "the encouragement and stimulation of all phases of private flying." Details: It would function under the Safety and Planning Division, would determine and realize the private flyer's problems and guide BAC and other governmental policy in their field. On account of "voluntary assistance" the personnel of the new section would be limited to the staff of the section—and not limited. There would be a "Private Flying Advisory Committee" of 50 members drawn from all branches of unaffiliated operations. Finally, studies were already started on the possibilities of a wide extension of physical requirements for Private Flyers.

All that made good point was, these Dan Roper had already picked up right on the job. And remember that—McCurran Law passage or no—this post of Director is a permanent one.

SPOT LANDINGS

On the Month's News

4 The House of Commons cleared what Vincent Massey, Assistant Secretary for State, numbered headlines to the effect that the Air Ministry would "explore" the American and Canadian aeronautical industries as sources for military plans. "Advertisement course" at Washington, says details, would try to buy 1,000 planes large—probably including several hundred long-range bombers.

Estimates here run from over up to 1,000 planes as what our defense can build for three weeks a twelve-month period. (The house had already discussed, already topped up on expert models will get orders in but not a few British squadrons. But that very British production programs will be set in motion while across the border half a dozen factories are already building today British and American planes for Canadian markets some very unlikely. The British will be cleared of the U.S. by our existing legislation which would cut off deliveries just when Britain would most need them—that is, immediately she got involved in actual battleships.

5 Heavy Pail, who bought the old house and beyond ship in which the Wright Brothers worked and built their first plane, dedicated them to his daughter's anniversary—eight last month. How commercial buy-outs turned up for the commercial case over showed up for a Congressional hearing. What they should do now is for specific support in the movement to get the first Wright plane back to the U.S. If Wright's old house and its foundation, he might be willing to let it go to Des Moines.

6 No time for a photo, in the explanation Chairman Joseph S. Ames gave in committee last month that the N.A.C.A. would be made this year to run its annual show-off party for the industry. Four is the right night upon the committee's big convention program which includes four new wing launch, additional shop facilities, and improvement of selling equipment.

7 The Department of War will be the most constructive act legislation out of Congress in many a week. It provides for five air mail war routes within the U.S. to expedite air mail delivery; a boost in the air mail mail service; four times 35,000 to 45,000, providing for the PMG to enter existing route contracts up to 250 miles; experiments with airports right on the job. And remember that—McCurran Law passage or no—this post of Director is a permanent one.

8 Pan American should get its design figure, that of the original eight amendments addressed for proposal on 100-passenger twin engine mail plane, says—Douglas, Consolidated, Boeing and Sikorsky—have turned in preliminary studies, and a B-23, Boeing's, came to the post as an added starter. Pan American is sitting on all details of the design proposals, but tells on the West Coast Pan Am Douglas has submitted a landing gear, the rest have waited until the problem is terms of flying tests.

9 Other FAA parties: The P.O. has awarded Pacific Alaska Airways (PAA) contracts the mail routes between Portland-White Horse and White Horse-James on which it was recently sole bidder. Pan American may get the 10,000-foot-of-lateral air near Bermuda, was about new battle of a sort. The P.O. got \$9,000. The Department of the Interior has granted Pan American a lease on Carter Island, the South Pacific map that the U.S. recently claimed was discovered by sea school. But permission to land in Hawaii has been specifically refused the British. That may eventually help Pan American's working agreement with the British for the New Zealand. The recent extension in Dublin was largely late governmental and still said. With weather service, radio, navigation, terminals. There is still some four feet that, Imperial may get Pan American willing to let it buy equipment to match the Boeing 314.

dispute. But information is satisfactory. Imperial will have to wait for payments, said officers in new lead planes, as the Air Corps comes in as actual flying boats and will probably let Pan American come as it stands on the Bermuda-Atlantic route as soon as the Boeing are ready.

10 Helms must be day-making, The U.S. which has no use at present for the balloon, said it possesses, recently bought up more with in Kentucky, thereby extending its monopoly of the product. Congress paid a low percentage to export Britain 200 conventional purposes Germany, 1935 to launch a 1,000,000 in U.S. supply, promptly ordered 1,000,000 in U.S. for immediate delivery, 40,000,000 in U.S. delivery over the next 100 years. Secretary later immediately changed down a system embargo. The Government and suppliers they wanted the gas for blimps and gas balloons if not for airships was children. Senator Thomas rushed in at 11:30 repeating all expert permission. "Why didn't I know the Government was up to 100,000,000 in U.S. and permission to repeat in Lebanon on transfer commercial gas?" It is the order of the day, do some high, but the commercial gas program—what there is left of it—should be set off in any way.

Later, word from Washington has it the whole affair had been authorized by the President for decision. Meanwhile the supplies here in President's seat have gone into.

Castello Bills Would Cut Procurement Savings

Air Corps and Navy expected to back measures easing losses.

TWO SENATE recently introduced by Congressman John M. Castello of California, the member of the House Military Affairs Committee, appear likely to remedy some of the defects of the Procurement Act of 1934, which have become more and more apparent as war-pieces accumulate.

HR 1001 enables the Army or Navy to introduce the "cut in price" of material concerning which the final cost is difficult to estimate accurately in advance and thereby cut the "margin" of the contractor, design, development, development, manufacturing, repair and overhaul. Controls which in an actual contract—profit plus overhead basis. The department concerned will decide its own decision whether or not such a contract will be entered into. The department and the contractor will agree upon a "margin" and upon a final cost, which will vary.

If the contractor exceeds the margin, then he will not be increased if, on the other hand, the contractor is below the margin, the margin figure, he gets 25 per cent of the saving, while the other 75 per cent is returned to the contractor. This arrangement is regarded as an incentive to keep costs down, and to eliminate the expense involved which prompted in connection with so-called "cost-plus" contracts during the World War.

The other bill, HR 1002, is introduced to recognize the danger to the contractor and to companies who in some way for their rights. It would prevent either department to expatriate any design or contract. If the reader and the department had themselves made to agree on price, the contract are open to them. A board of arbitration may be set up to render the matter, as similar may be set in front of Congress for the value of his design.

In the past, the Army, while it tried to recognize design rights, has left the rights in the hands of manufacturers. When the policy of the Army, when purchasing experimental articles restricted by "from the ground up" to let the right to the design as well as the article itself.

According to a representative of the bill, this practice has worked out in a way in two ways. First, the Army opinion has required the contractor to submit a plan of action in a design study. The winner of the competition received pay for his article, while the second and third lost received nothing.

Contributions to the Army, in its other hand, always faced the possibility that, having completed an article, he might be asked to design a study and put it in competitive bidding, while the original, not having received full compensation for his design, had not even been fully paid, for the



TREASURE ISLAND: That's the offering the the San Francisco World's Fair crowd have given the site of their coming show. After the fair is over the building in the right foreground will become an air terminal. The two buildings behind it will be hangars. But the San Francisco Fair and the one in the background in New York promise more than a possible airport site to the aviation industry. Both will be complete sites for direct flights. Both should help run up new highs in passenger transport. The San Francisco Fair, by working out experiments, made transportation industry during the late Chicago Fair. Air travel in 1933 moments may be our big buying point.



CESSNA: William A. Grogg, president of Cessna Aircraft Corp., compares two-headed eagle-like puffs that his new 410 firm will shortly market its four-place "Goldenraider" twin jet.



BOSS PILOT: Eugene F. Brees, Commander of Fykes, for United Airlines, not only looks after all U.A.L. flyers. He has found time to take a leading part in Calver's brilliant blind-landing research.



PROP MASTERS: Robert L. Earle (left) and Berdette S. Wright who will head up the new Curtiss Propeller Division (see story on page 62). Wright, already vice-president of the Curtiss-Wright Corp., will serve as General Manager. Earle will be next in charge as Assistant to the General Manager.



HEROES RETURN: Flying Officer A. E. Charles (left) and Victor Roberts are greeted by their wives as they land after a trip to New Zealand and return in 13 days 20 1/2 hours. About that breaks any number of May-pot to that point records, the British press call it the greatest flight yet.



NO CIGAR: Law Barlagan, top flight starting pilot, lands after a climb over Monrovia, Tenn., to 6,210 feet. That's higher than the summit of E. Mount of 6,210 feet but not by a wide enough margin to rate recognition as a new record. The world record is 14,130 ft.



MEDALIST: Robert V. Rhine, H.A.C. engineer who has won the Wright Medal for the best S.A.E. semi-dynamic paper of 1935.

AVIATION PEOPLE

Who's Who in This Month's News



DIRECTOR: H. E. Lawrence, who has headed Curtiss-Wright advertising since 1930, now is that company's new Director of Advertising and Public Relations. Harold S. Galt whose appointment was noted last month ago serves as Manager of Public Relations and Publicity.



SOLDIER'S FAREWELL: Master Sergeant John Deles retired last month after 25 years service in the U. S. Army, 25 of them with the Flying branch. He shared as Son Jack Holt with "Teddy" in '18. He was a member of "Pals" 1st Aero Squadron. He trooped after WWI. During the World War he served as a First Lieutenant attached to the British air force as American observer. The Corps will miss him.



TO RUN STINSON: Albert L. Lindsey, long associated with Curtiss-Wright and recently appointed executive vice president of the Aviation Manufacturing Co., has taken over the presidency of the Stinson Company, succeeding F. O. DeWitt, who resigned last month. William A. Mack, vice president, already V. P. in Charge of Sales, becomes Asst. General Manager. G. R. Mosko, vice president, already Treasurer, becomes Asst. General Manager in Charge of the District.



TO RUN VULTEE: Richard W. White, formerly executive and member of the executive committee at Douglas Aircraft has been named Vice President of the Vultee Manufacturing Company and General Manager of its Vultee Aircraft Division. Left to right, L. G. Gorman, Asst. Secretary and Treasurer; Sidney W. B. Hirschman, Superintendent, and R. W. Palmer, Chief Engineer.

The Cardiac Constant, Speed Paced

Corbin reports unfilled orders of more than 800 of the two types of propellers. Manufacturing of the Corbin Propeller Division will be, at the present, stationed at the Buell plant, where an expansion program, under way to provide enlarged new business facilities.

BODY (ALSO WINGS) BY BREWSTER: A first good photo of the Navy's new XP2A-1 built by Brewster Aeronautical Corp., Long Island. Engine is by Wright.

[illegible]



AVIATION

OPERATORS CORNER

Tagging The Buses with

—LES NEVILLE—

Non-Scheduled Operators Move to Organize

Suburbs against C.A.E. by private firms and fixed base operators all over the country are giving birth to makeshift organizations designed to protect the interests of these groups. Many manufacturers there have tried to meet the new regulations, floundered on their legal, philosophical and even way to dispute. Then they have come to the conclusion that the rules were made for the airlines.

In the last few months local organizations have sprung up as a result of subcommittee meetings in the Middle West, Southeast, Florida, California and New England, and rapid progress is being made on the creation of a National Organization, under the leadership of Hugh Robbins and Hal Henning. Although the ultimate focus of the movement is still under discussion, the chances are good that a defense strategy soon will be decided.

Meanwhile the Bureau of Air Commerce is hard at work carrying some of the most objectionable features of C.A.R. Within the last few weeks a rough new schedule Chapter 10 has emerged from the committee.

An urge on the Bureau is willing to listen to our requests it is our obligation to work with them in the perfection of the regulations. When they turn a deaf ear to our proposals it is time to stand the way out. But in the meantime we should make all possible heads in creating a central clearing house to aid and assist the dissemination of the administrative lines and prevent a concerted pressure to Washington that will be constructive rather than destructive.

Fly-In Operator Meet Patterson did such a few job reports to Southwest Aviation Conference at Oklahoma City. That he was appearing temporary chairman of the organizing committee for a permanent association. (See page 10). On the Pacific Coast our Western Region McGovern has been working nights and weekends helping the operators get organized. Several meetings have been held and an executive committee appointed to present the concerted voice of the group to a national organization. (See page 15).

While Hugh Robbins and Hal Henning are hard at work organizing fixed base



Hugh G. Robbins, wearing out his diaphragm corresponding with prospective members of new organizations.

operators and private firms for their collective protection, the Bureau of Air Commerce has taken steps to encourage the rights of these extensive groups. One of the first official acts was New Director Dennis Mulligan in the formation of a Private Plane Section. Plans are still tentative but they tentatively include appointment of a director who will work with a consulting board of 50 members of the industry.

There is something for operators to think about in the new C.A.E. "Pete" Page is doing it well and advanced scheduled operations in Connecticut. Under the watchful eye of Commissioner Les Neville's little W.P.A. money is being spent to pay bill a dozen different teachers to run classes in various parts of the state. This ground school instruction doesn't compete with the education of the private operators but to say his formalized firm with 10 flying students whose interest was aroused by the classes. It makes you more aptitude to do a little of this schooling on their own spare time.

Up State Illinois way State Airport Director Willard Fletcher has set a new high standard in conference. The Maritime Regional meeting of the N.A.S.A.G. was one of the most sat-

isfactory ever held. Chairman Fletcher not only had sufficient thought to reserve his courtesy to live contributors but provided plenty of time for discussion between groups. Even the most common of state regulations, before his Max Picket and Bud Aldrich (who never miss an N.A.S.A.G. meeting) as matter where it was highly pleased with the positive attitude of the contributors to their sides.

In a few well known words Bureau Traffic Control Authority Earl Ward took a lot of terror out of C.A.R. as applied to private flying and every one left with a better understanding of the new regulations. Also from the Bureau came Airport Chief Whitham who previewed pending legislation and brought on the important point that federal assistance for airport development is apportioned equally in the Los Angeles Act of 1938. The airport expansion has been in the Air Act for 12 years. It might start in the new law, however, considering the general concept of airports as the least responsibility of city, state, and nation.—L. N.



Willard Fletcher rolled up his sleeves and put on a solid regional corner of the N.A.S.A.G.



LARGE TRANSPORTS of the immediate future will hold no terror for this hangar meeting conference as part of the W.P.A. project under the direction of Manager Harold Shuler at Southern Municipal Airport. With sections open over 100 ft wide, 10 ft high and in the 50,000 sq. ft. hangar are now available space for offices, machine shops, spray room, etc., as well as ample hangar space for privately owned ships. Unit builders will be encouraged by the improved portable shops which now in use at warehouse and dismantled under Manager Shuler's direction.



THREE DAYS after fourteen ships were destroyed in the major configuration at Milan Area Insurance Underwriters met tonight. Miss Amelia Fletcher, head of their Claims Department in Miami via C.A.R. with claims totaling over \$100,000 to arrive the damages. Miss Fletcher is the only woman claim agent in the business.

Exchange Stabilization Needed

O. J. Whitley cites necessity for Federal Clearing House

FOREMOST AMONG TRACKERS in the FOREMAN MARKET is O. J. Whitley, president of O. J. Whitley, Inc., who has found it profitable each year to climb into a Redstart and spend several months flying around in the neighborhood of the operator selling airplanes like a grown-up difficulty in keeping his eye to some home on and such from his. Some days several offers of enthusiastic purchasers to buy the airplane set down under him. He always comes back with a pocket full of money.

Chief fly in the movement is the competition of European airplane makers who come armed with various forms of credit from their respective governments. He says as each season for air experience in the following letter O. J. expresses his views on the need for some sort of credit clearing house sponsored by the federal government. His idea has been echoed by many others including Mayor La Guardia, of New York,

whose campaign on the subject was published recently in the newspaper. The selling of American aircraft in South America is not all a lot of money for any nation although they are much profited even European aircraft by both planes and their operators. The big question of exchange comes up, in only making of the credit clearing. It is used to stay at the bank here in Santiago, Chile, for thirty pesos per day, including all funds, which is about \$135 in American money, but when this is reversed, and you are trying to sell them on airplanes it isn't so good. When you stand on credit with the seller you should not be surprised if you do not get it. Both the Germans and the Italians will give up to five years' credit. This is not only true in Chile but is also true in most every country. We Americans are all living like the Germans and Italians due to the willingness on their part to extend long time credit. I am sure that the German

and Italian manufacturers are not giving this credit, but that they are being helped in some way by their respective governments. In fact, it is common knowledge that the customers of these countries are also officers, as well as ordinary sides.

We cannot afford to let this most valuable market be taken by Europeans when it is naturally being to us, and especially when they are so anxious to buy from us, but can't, because of a lack of immediate cash. I don't think something we can do to meet this situation?

Would it not be possible to create a national clearing house? We are spending money for so many things that don't seem to be as important as securing a market for our manufactured goods which would give larger cash each working year. If we can do it in the beginning, the market will be left for years to come. For once a type of security has been used and has been standardized it is very difficult to replace it with one equivalent. That is why it is so important to the Manufacturers of Aircraft in this country to get it at the start.

I suggest that the drawing of sales to these countries be considered by our Government and that some immediate steps be taken to help close the sales of European planes in this national United States market.

O. J. Whitley, President



O. J. Whitley came back from a four week trip to South America.

Geost Operators Organize

Permanent Organization Pleased at Meeting in L.A.

Meeting during the L. A. show, approximately fifty representative southern California aircraft operators met and decided to undertake a permanent organization to support the national movement now under way. The Los

Angles meeting was called by a modulator consisting of Bert Stone, Warren Garry, Ed Lyons, Steve Kaplan and Charles Nickols. Bert Stone served as chairman of the meeting. After voting to undertake a permanent organization, the operators present agreed a fund to cover operating expenses and named by vote an advisory organizing committee as follows: Dorland Stone, Charles F. MacDonald, Warren E. Garry, Ed Lyons, Mary, Boyles, Jerry Tordella, Judah B. Ben Schmitt, and George W. Armstrong, members at large; and the following as representatives of operators and pilots at each airport: Miami: Joe Lewis, Vance Air Terminal, Joe B. Plummer, Grand Central Air Terminal; Fort Lauderdale: Oliver Field; Kansas City: Harlow, Los Angeles Airport; John A. Zuparkovich, Alameda Airport; Bill Sage, Rye Airport; Pete Loomis, Cedar City Airport; Doug Kelly, Lindbergh Field; Los Angeles: Arnold Speer, Speer Airport, San Diego; Harvey Martin, Long Beach Airport; Floyd Martin, Santa Ana Airport; Harry Henry, Riverside Airport; Don Kaufman, Arlington Airport; Dwight Reynolds, Bakersfield Airport; Gary Cook, Oake Airport; Sam Bernhardt; Al Tedder, Colton Airport; Don Wiers, Sonoma Airport; Arthur Nelson, Oxnard Airport; Kenneth Benda, Pomona Airport; Gordon Eads, L. A. Metropolitan Airport; Arthur Martin, Western Aviation Airport, Los Angeles; Roy Bolinger, Compton Airport; Jack Kohn, Burbank Airport; Don Stone, L. A. Fontaine Airport; Gus Parsons, Palm Springs Airport; Burton Blandy, Glendale Airport; Ed Hagblom, Santa Paula Airport; and Norman B. Boudin, San Jose Airport.

Southwest Fliers Organize

Mass Patterson elected temporary chairman of committee

Five operators met at the Southwest Aviation conference meeting in Oklahoma City March 11 and 12 voted organization of a permanent association to represent southwest aviation interests, private and commercial. Mass Patterson, Oklahoma City, temporary chairman. The conference adopted resolutions which condemned federal regulations, suggested changes, and asked federal appropriations for municipal airports. Following the business session, delegates met in a municipal airport, where a federal aerial demonstration was conducted with approval of four airplanes which had taken off from 20 Oklahoma cities.

Members of the organizing board are Ed Weaver, Dallas; Eds Pugh, Santa Fe; Fred Martin, Glendale; Paul L. Alford, MacDonell, Wichita; Frank Schaeffer, Albuquerque; W. C. R. Smith, Cheyenne; J. E. Mowery, Kansas City; W. R. Shady, Tulsa; and Stanley Walshaw, Denver.

Question 38:

Do you feel that fixed base operators need an organization to protect their interests and present their views to legislators? If so, who should be included in such an organization? How should it be supported? How should it be organized?

At the Chicago Conference of Fixed Base Operators in February, the need for a national organization of private base and maintenance operators was the principal subject of discussion. An organizing committee consisting of Ralph Anderson and Neil Henning was appointed to assemble the members of operators and others throughout the country, who were not present at the Chicago meeting. The question has now got up on the agendas of AVIATION'S Operators' Corner and expressions of opinion are urgently requested. The following letters are from Ben Kolbar, Pilot.

New England Organizes

WE UNDERSTAND that you are appalled by a newly formed National Operators' Association to help attract a definite structure of organization in Massachusetts we have just formed our very own association which includes operator members, commercial members, and aircraft mechanics. The purpose of our association is to cooperate with all existing state, federal, and municipal authorities for the promotion of aviation and to disseminate information among ourselves relative to the state of development of aviation. Our organization has been functioning since November 1934, and its membership includes the majority of Massachusetts operators. The commercial membership and aircraft mechanics membership is steadily growing.

It would seem, therefore, that the operating group of this association should be in an ideal position to be organized and become a part of the activities of your new National Organization. Plans and we complete information as to what you have accomplished to date and advise us what we can do to help you not forget that we will get right on the ball in Massachusetts. We feel certain that we can help organize local efforts in many of the New England States and, thereby, give you a solid New England representation—James (Jack) Driscoll, Secretary, Massachusetts State Aviation Association.

A Manufacturer Speaks

I AM VERY MUCH IN FAVOR of any organization which has for its purpose the strengthening of aviation.

We believe, at present, that the rules have been made to favor the nation's manufacturers, the victims of whom they will do whatever.

I shall be very glad to hear about your organization and if there is any

way in which we can be of help, do not hesitate to write me. W. T. Davis, President, Piper Aircraft Corp., Lock Haven, Pa.

REPORT CARD

Of Air School Developments

Three new courses in addition to those in Aviation Mechanics and Diesel Engines are now being given by the Stewart Technical School, 253 West 18th Street, New York City. These courses are: (1) Aircraft Sheet Metal work is designed to equip the students with a thorough knowledge of production methods, fabrication and repair of metal airplanes. (2) Aircraft Radio which covers the principles of modern radio apparatus with special reference to aircraft radio communication and aircraft navigation. (3) Aircraft Drafting and Design which is for those who are interested in the practical engineering problems of Aviation.

Thirty-two young men representing fifteen states, Canada, Mexico, Alaska, and Hawaii were graduated March 11 from the Boeing School of Aeronautics. According to George B. Myers, director of flight instruction, several students have been awarded new pilot ratings by the Bureau of Air Commerce. They include W. D. Brady of Edmonton, Canada, who scored his Commercial Pilot Rating; Maurice Gledhill of Penticton, Canada, Commercial Pilot Rating; Lawrence Hamilton of San Diego, California, Instrument Rating; Peter C. Carls of Los Angeles, California, Instrument Rating; and Oliver W. W. of Rochester, New York, Instrument Rating. Graduate Owen Johnson has been appointed traffic representative for Pan American Airways' Pacific Division at Maui, Midway Island. R. C. Hayes, head of the aeronautics department recently was elected president of the Northern California Branch of the American Aeronautical Society. He has been extremely active in the growth for the past two years.

During the past month a considerable number of firm students have gone to work for the Air Corps as inspectors for their plane's license. Among those awarded have been commercial (Transport) licenses to Earl E. McKee, Seattle; Steve B. O'Brien and Marvin Bradley, Pease Valley, Oklahoma; limited commercial licenses to Fred Stevens, Elko, Idaho; New York, private licenses to D. P. Roberts, Idaho Falls, Idaho; Russell Smith, Chicago, Illinois; Clifford Baker, San Carlos, Arizona; Jack Lopez, Waco, Texas; Washington and Percy Bawell, Jr., Washington, D. C.



...SCHOOLING NEW PILOTS in the U.S. Army Air Corps

A significant testimonial to the quality of STEARMAN training plans is their selection for the rigorous primary training program in which the United States Army Air Corps is schooling its new pilots. Learning to fly in a STEARMAN PT-15A is an important first step in the military pilot's intensive training. . . a training which reaches its highest peak in the command of the Army's mighty four-engine B-24 "Flying Fortress."

STEARMAN primary and advanced trainers have earned an international reputation for versatility. They are now in use in the Standard Army Air Corps, the Argentine Naval Aviation Service and the Philippine Army Air Corps, as well as in the United States Army and Navy.

THE STEARMAN AIRCRAFT COMPANY, VIRGINIA, KANSAS, AFFILIATE OF THE BOEING AIRCRAFT COMPANY

"Semper Paratus"

(Continued from page 25)

patrol. Without any specific requests for example it might need a plane to cruise about once a hour for full of small aircraft once a Summer Sunday. But actually use out of the flights are made with some very definite objectives. A ship at a small boat is reported missing. A vessel radio it is in distress. There is some particular type of interesting activity to be expected along a coastal stretch of sea coast or harbor. A ship reports a case of acute illness or critical injury that requires medical attention ashore. Once the flight starts a general watch is kept of all the area passed over, ships are identified and reported, etc.

There is little routine traffic with land vessels either. Very rarely the severe restrictions that on visibility decrements, so too does the efficiency of airplane patrols. As each request for aid comes in the commanding officer must weigh the possible fruits of success against the chances of failure. There is no side stepping of an assignment through lack of courage. No one remembering the reason of the area of the flying that crashed during the Alcoa search, no one who looked over once the lifeline Coast Guard station log would ever raise such a question. And as the CG's "Aviation Instructions" to refer to an "Coast Guard" where lives are definitely at stake and can be saved only by aircraft. A pilot of experience and of sound judgment will know when the chances of success are sufficient to justify the danger to the crew of the plane. The decision he will have to make is not involving what is necessary and available, and what is (usually and should) . . . It is a responsibility which goes with a commission in the Coast Guard."

Specially the Coast has one emergency condition that sets it off from all other types of service and observation flying—landings in the open sea to rescue survivors of disabled vessels, to rescue persons in the water, or to pick up emergency medical cases.

Obviously there is little in their mission that they can use as an accepted practice in other fields. The average CG. however is much like any other well trained one. Its marine bases have outdoor wooden ramps. Seaplanes and landers are worked in and out with tugs. Fueling is done from Aqua-System tanks. Dis-

patching is done on the base of accurate and up-to-date meteorological analysis methods. Each station has its own direction finding radio. Each plane has complete two-way radio and its own direction finder. Landplane operations are as normal as any X-country flying. Landings on structures at sea—on mountains. Coast Guard planes must land over 200 miles or so off the coast—are difficult but no more so than similar tasks carried out on routine by other services.

Procurement

The procurement problem is therefore also a mixture of the ordinary and the exceptional. For its landplane work it has Fairchild and Waco, a Grumman, a Lockheed, a Beech, and a Northrop. These were simple and easy choices. For coastal and shipboard use it has a big fleet of Grumman JF-2 seaplanes and is getting three Curtiss SOC-4s. There, Navy loan ships were easy to follow, in fact Navy inspectors were already in the plants concerned and could take over the inspection work.

A couple of years ago the service decided in needed planes specially adapted for shallow water operations—along the Coast coast, on Florida lakes, and between Florida Keys. The result was an order for a half dozen little Whiting flying-boats that CG officials would soon find in a hurry down Coast again the CG and what it wanted.

A tough water flying boat for offshore going into a problem must maintain the Coast Guard's own standards. The Navy and the Transocean airlines also want more toughness characteristics. And they must be previous in getting these too. But with them vigilance as a basis of operations was an emergency consideration. What must nearly have been the previous wing qualities of speed, payload, etc. The Coast Guard needed little in existing speed. Its requirements for emergency payload and for general use were satisfied but not near design limits.

It lay out a handful of lessons from the ships it had. It compared notes with the Navy. Its own experience and its high wing loading. A tall high out of water. A hull with none of the characteristics of the old SC

hulls. It made specifications. It selected bids. The award was in order for seven PM 2 201 Albatross flying boats at a land cost, complete, of some \$450,000. The first is undergoing extensive tests. The rest are due this Spring and Summer.

The particular performance specifications—each one are interesting—Take-off time in calm 900 to full load, 174 seconds.

Landing speed 60 mph.
Range at sea level at maximum speed with full 10 full load, 1000 miles.
Service ceiling, 12,000 ft.
Time to climb to 10,000 feet, 10 min.
Maximum speed at critical altitude, 167 miles per hour.

Enough water was considered as one of from four to five feet. The sea conditions were similar in that they were about four points from the direction of the wind. Landings were made without damage to the airplane and was fully experienced with wing no float advantage. Take-off from calm sea was accomplished in 11 seconds. The first would have been better except for the reduced engine chugging up emergency.

The Future

Like any young service doing a large job, the Aviation Division, definitely has plans for expansion. Sometimes this means it will devote its funds one quarter at Ford Island Field, Cook County-Wright SOC-4s will let it set up operations on base of the Coast Guard's seven big carriers. New orders now being planned will be equipped for other points such craft. All the present ones can handle them on an emergency basis. There is a bill just through Congress to permit the establishment of a base at the San Francisco Maritime airport.

Less equipment, yet still on the deck, are long delayed plans for a base or two somewhere on the Great Lakes. There are possibilities of more extensive activities along the Mexican border and along the Canadian border as well. A station at Norfolk to break the long gap between New York and Charleston would be highly desirable. There is a job up north of the Atlantic shipping lanes spotting sailing movements that is just crying for a second or two—two Coast Guard planes could cover the whole flow in a day's flying and send their findings by radio. There is also a lot of coast albatross aerial and a high wing loading. The new wing old Semper Paratus (always prepared) wouldn't tackle.

In "Cyclones" . . . dag is used!



Well-known to technical men are the stresses and strains set up in the operation of modern airplane power plants. It is, therefore, significant that "dag" colloidal graphite is being selected by an increasing number of engine manufacturers as the auxiliary lubricant to use in combating these wear-producing conditions.

In an industry where positive performance

is vital, where "check and double check" is the watchword, materials and equipment accepted must undergo rigid test.

The use of "dag" colloidal graphite by the WEIGHT AERONAUTICAL CORPORATION is a powerful testimonial. They find that the graphoid surface gives added protection to the metal parts subjected to high temperatures and heavy pressures. All overhaul and repair jobs are set up and assembled with "dag". Write for technical data.

ACHESON COLLOIDS CORPORATION
PORT HURON, MICHIGAN



used by the Coast Guard to their own craft: transmitter, Model T CGR 40 which employs but one tube, a type 807 pentode. The entire transmitter, with its cabinet and shock-mount weighs only 8½ pounds. The unit, with a companion receiver of slightly larger size and similar appearance, was especially developed for use in small planes such as the V6eng flying boats and Waco utility biplanes, in which space is very limited. The transmitter operates on cw, low or slow speed. The power output on cw is 8 to 12 watts on phone or cw 3 to 5 watts with 90 per cent modulation. Phone modulation is obtained in three high level single-tube stages and a modulator, transformer-coupled to the speaker circuit. Feedback between screen and suppressor grids is used to obtain the tone for cw operation. Crystal control is used, so any frequency between 2000 and 3000 kc.

The receiver covers two frequency ranges, 200 to 400 and 250 to 1500 kc. An array of seven state detectors, with their associated five bar and radio interference possibilities, it has long been standard practice in all Coast Guard planes to bond every metal part to the plane to the main frame. The test requirement is that the contact resistance between any and all adjacent metal parts shall be not more than 0.002 ohms measured with a current of 5 to 6 amperes at flowing through the joint.

Tubes of manufacturer's samples are conducted in the Coast Guard laboratory at Fort Belvoir, Virginia. The component must operate satisfactorily at temperatures from minus 20° to plus 120° F. and at relative humidity up to 90 per cent. All models are subjected to mechanical vibration and drop tests. All components such as transformers, resistors, etc. are given an impedance test at intervals with water, after which they must operate normally.

Radio Installation in the New Hall Seaplanes

The very latest and most advanced radio installation in the Coast Guard aircraft fleet will be that now under going installation for the new PH-2 Hall Patrol Seaplanes. The PH-2 radio installation will include the following: a 100-watt main transmitter, a 15 watt emergency transmitter, a combined direction finder and receiver, a crystal controlled frequency monitor, and a complete telephone system.

The main transmitter type 2-24-1 operates from power supplied by a generator connected to one of the co-

Coast Guard Radio

(Continued from page 41)



Emergency Indicator for Direction Finder

gnition of the ship. It covers the frequency ranges 275 000 kc. and 2600-12 000 kc., continuously variable throughout the ranges mentioned. The transmitter may be set to any frequency within the specified range with a precision of 0.02%, by means of the crystal controlled oscillator. Cw and voice emissions are provided. The indicator in the form of a light cathode ray and the frequency at use permits, is set through the typical C.G. adjustable impedance matching network.

The emergency transmitter has a rated output of 15 watts provides cw, main and voice emissions covers a frequency range of 2600 to 3500 kc. normally but can be controlled in this respect by means of interchangeable tuning units, to cover any other particular frequency. Frequencies, it continuously variable, with crystal control provided for any particular two pre-selected fixed frequencies desired.

The receiver direction finder covers an overall range of 200 to 15000 kc. with direction finder operation limited to the 200-1500 kc. band. The direction finder is of the aural and indicating type and utilizes an electro-magnetically shielded, rotatable mounted, amplifier loop. Undesired (interfering waves) operation is included in such manner that 100-degree ambiguity is definitely distinguished as in the case

with all direction finders used by the Coast Guard.

The frequencies of both transmitter, other than those directly crystal controlled in the emergency transmitter, are monitored by means of a separate crystal controlled monitor which maintains an accuracy of 0.02% in any selected frequency within the range of -50 to +50 degrees C. The indicator of this monitor is so constructed that the higher frequencies are shown in increments of one note division per kilocycle while at the lower end the subdivisions are of the order of one tenth kc. per scale note.

All sections of the crew which includes pilot, radio operator and mechanic, are in constant communication with each other by means of the telephone which is also arranged so as to give the pilot partial control of the radio facilities when so required. All Coast Guard aircraft of the patrol and transport types carry a radio operator who attends to the communications and aids the pilot by offering the various radio aids in conjunction to their fellow advantage which cannot be so completely and readily accomplished if the pilot or cockpit were required to operate the radio equipment.

Improved Type of Direction Finder

The Coast Guard has, in the past, used the development is type of direction finder which, in addition to the conventional aerial coil type of installation will utilize a cathode ray indicator in the form of a vacuum tube having a fluorescent screen on which a dot image appears in such manner that the relative bias of bearing obtained by the direction finder is indicated. The arrangement of this type of equipment as proposed for installation in larger patrol airplanes such as the Hall PH-2 type, would include two separate indicators, one near the radio operator and one located at a convenient point in the central cockpit. The radio operator manipulates the various controls of the direction finder which turns the pilot and co-pilot free to perform the manual duties needed in flying the plane. The cathode indicator conveniently indicates the attitude of the aircraft with regard to the observed radio signal being employed for guidance purposes. When the screen image is vertical (see photo) the pilot knows he is on course while any deflection of the line pattern from the vertical indicates veering to the right or left of the course.

DOUGLAS

First
IN AIRLINE SERVICE
First
IN AIR DEFENSE

Action throughout the world by more Douglas planes more radio than any other type of equipment. There are more Douglas and Douglas built biplane planes in U.S. Air Forces than any other single make. These "buses" are not alone because—instead, they are the natural result of Douglas' more complete research, intensive development and continuous craftsmanship in building air planes. **DOUGLAS AIRCRAFT CO., INC.** South Monica Calif.

Authorized General Sales Agent of Douglas Aircraft Company
and Military Aircraft

Buyers' Log Book

(Continued from page 20)

rubber-like tube held in a cavity of the torque frame.

Forces generated by the brake hose are transferred equally to the circumference of the torque frame through mating legs engaging in a cavity on the brake frame.

Features include uniformity of pressure around the brake drum, ability of the brake to conform under all conditions, and long living life and uniform adjustment for long wear.—*Inventions, May, 1938*

Sodium Marker Light

Wetenschappelijke navigatie marker licht night landings

AN EXTENSIVE NEW TYPE navigatie marker light has been developed by the Wetenschappelijke Elektrisch & Mij. Company. Covering a horizontal beam instead of vertical, the new light holds



G. B. Jordan's gear and flap position indicator 2 views.

90 per cent of the illuminance within 15 deg. of the horizontal carrying a path of light along the runway boundary. The entire unit is located beneath the runway surface except for a the elongated sodium head which contains the lens and light element. The lens is made of the new shatter resistant Herculite glass. Light is furnished by a sodium vapor and seal, being monochromatic it is not possible for fog and haze to a light degree.—*Aviation, May, 1938*

Flap Indicator

By General Electric shows position of landing gear on wall

Price of a new line of aircraft instruments to be offered by General Electric Co., Schenectady, New York is a simple indicating instrument which shows precisely the position of flaps and landing gear, including tail wheel on aircraft used with retractable gear. Other electrical instruments are to be offered for indicating of pressure, fuel pressure, oil temperature, manifold pressure, carburetor air temperature and burner temperature. All will be operated by the new d.c. battery, a most G.E. development which is an application of the well-known self-synchronizing motor principle running to a.c. current, to one with d.c. current. Available in standard size retractable instrument cases with side coupling and dial illumination, the G.E. landing gear and flap position retractable system complete, including all line leads, weight only 35 oz.—*Inventions, May, 1938*

Window Shopping

Interesting catalogs recently received

Write direct to manufacturers for the following:
AMERICAN LENA CORPORATION, Chattanooga, Tennessee.
CROWLEY LIGHT—A one page chart listing properties of various lighting materials of the American Lamp Corporation.

BROWN & BROWN MFG CO, Towson, Maryland

Appl. catalog of portable test—A beautifully illustrated 36-page catalog of the Brock & Decker line of portable electric tools.

MOLLYN MFG. CO., Watertown, Ohio

General Reading Equipment Catalog—A catalog of general interest to

all factory and workshop men, but of special interest to aviation plant men due to unique nature of equipment described, which gives promise of great flexibility and economy in handling of a wide range of materials that must be stored or moved around the aircraft factory.

EMERSON AMPLIFIER COMPANY, Cleveland, Ohio

Additional data sheet for Parker Engineering Bulletin No. 36. Of value to everyone concerned with hydraulic systems.

EMERSON LAMP CORPORATION, 25-21 Lexington St., Newark, N.J.

Refined lamp catalog—A booklet describing position lamps for aircraft landing lights, airport floodlights, ship-ways and airport beacons, etc.

SAATCHI AIRCRAFT CO., Minneapolis Airport, Chicago, Ill.

A 64-page catalog of accessories, instruments, and parts with additional useful information for pilots and operators.

SPARKS-DUNN, Inc., 120 North Jumper Street, Philadelphia, Pennsylvania.
Sparkes-Dunn Instrument Catalog—Describes a complete line of electric relays, timers, and thermostats. Write for Catalog D.

THE WEATHERED COMPANY, 300 East 131st St., Cleveland, Ohio

Aircraft parts, fittings and fittings—A beautifully bound catalog of latest tube fittings and fittings have been manufactured for the aircraft trade. Twenty-eight pages of pertinent data.

WERNER-PHILIPSON Electric & Mfg. Co., East Pittsburgh, Pennsylvania.
Wern-Philipson Johnson Contact Lights—A booklet describing lights designed primarily for use on the approach end of runways. Both airport lights are carefully described and illustrated.

WILLIAMS, PROCTOR, Inc., Reading, Pennsylvania.

William's products for industrial safety—A general catalog listing in 34 pages the safety devices such as goggles and bands, respirators, etc., offered by William's.

Aviation, May, 1938

The STINSON RELIANT *for 1938*



New cooling system—temperature increases immediately—new materials but new appearance may be missed in flight.



A new balanced post-mount air intake system and new landing gear—this is the new Stinson Reliant.



Instrument panel will be delivered with the accuracy of the new instrument panel. Most difficult features of instruments.



Fixed pitch propeller has changed the whole idea of propeller—fixed pitch propeller the whole new look.

New in the sense that a FINE DESIGN IS IMPROVED

The New Reliant has a score of new features . . . better speed . . . slower landing speed . . . more viscous better brakes . . . softer shock absorbers and a number of other desirable improvements which make flying easier, more comfortable and reduce operating costs.

The New Reliant does improve a fine pattern so popular during the past few years that we have been able to say that Reliant are America's First Choice four—five passenger cabin planes . . . we say this because more people bought more Reliant than most all similar types of planes combined.

We hope you will like the New 1938 Reliant so much that you will buy it . . . we invite you to visit your Stinson Distributor . . . he will allow you to examine the Reliant as critically as you please . . . then fly it enough to appreciate its superior points . . . it is our experience that the more carefully a Reliant is compared with other planes, and the more it is flown the easier are the probabilities that the Reliant will be the plane purchased . . . we can't talk quality into a Reliant but we do put it there where you can see and feel and fly it . . . ask for a demonstration.

STINSON AIRCRAFT CORPORATION

(Division of Aviation Manufacturing Corporation) NEWARK (Central Newark) NEWBRIDGE



KOLLSMAN Sensitive Altimeter

"Kollsman two nine nine five" is the radio message the pilot has received from the airport tower which he is flying. He has set the barometric scale of his Kollsman Sensitive Altimeter to 29.95, as shown at the left, and is flying at an altitude of 7,000 feet. He knows that the altitude of the airport is 1,240 feet, and he knows that his altimeter will read that precise figure as his wheels touch the runway.



The Pennsylvania Great Airship Corporation works as follows:

"As a result of our flight in the Pennsylvania Great Airship Corporation has been presented with the coveted 'Airship of the Year' award by the National Aeronautics Association." By the National Aeronautics Association.

"We are very proud to show the world that we are not only a safe and reliable aircraft, but also a very modern one."

KOLLSMAN Station Barometer

The radio operator has set the hands of his Kollsman Station Barometer to 1,740 feet, the altitude of the airport, and reads from the barometric scale the Standard Atmosphere sea level pressure, 29.95 inches of mercury, as shown at the right. This figure he transmits to all incoming pilots as "Kollsman 29.95". The combination of Kollsman Station Barometers on the ground and Kollsman Sensitive Altimeters in the air is helping to maintain safety records of airline operation throughout the world.



KOLLSMAN PRECISION AIRCRAFT INSTRUMENTS

KOLLSMAN INSTRUMENT COMPANY, INC., 1005 FORTY-FIFTH AVE. ELMHURST, N. Y.
WESTERN BRANCH: GRAND CENTRAL AIR TERMINAL, GLENDALE, CAL.

AVIATION
Rep. 1120
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Ryan votes for AIRWHEELS®



SAFETY, comfort and "soft" landings are three big reasons why the Ryan Aeronautical Company has standardized on Goodyear wheel equipment for the past four years. Its two latest ships — the snappy Ryan S-T sport training plane and the Ryan S-C metal cabin plane — are both equipped with Goodyear Airbrakes, Goodyear airplane disc brakes and Goodyear tail-brake.

Maximum safety in landing and taking-off — on any field — is insured by big, super-soft, extra low-pressure Airbrakes with their wide, weight-spreading tread. They do not bog down in mud, sand or soft ground; they smooth out rough fields — absorb bumps and jolts.



Unexcelled reliability is one of the noteworthy features of the new Ryan S-C metal cabin plane — equipped with Goodyear Airbrakes, brakes and tail-brake.

In selecting Goodyear disc brakes Ryan checks with the experience of many other leading manufacturers who say these smooth-action, powerful brakes are the safest, surest, most dependable made.

That is why more and more ships throughout the world are being equipped with Goodyear tires, wheels and brakes. Let us cooperate with you in designing tire and wheel equipment for your new models — write Goodyear, Akron, Ohio, or Los Angeles, California.

"AIRWHEEL", a registered trademark of The Goodyear Tire & Rubber Company.

THE GREATEST NAME IN RUBBER

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ON YOUR NEW SHIP SPECIFY GOODYEAR AIRPLANE TIRES AND BRAKES

AVIATION
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Likorsky

1913 FIRST FOUR-ENGINED BOMBER IN THE WORLD

May 13th marks the twenty-fifth anniversary of the first flight in history of a four-engine airplane. It was the Likorsky shown above, seventy-three of which were built and successfully flown between 1913 and 1917.

1938 NAVY'S LARGEST PATROL BOMBER

The "Flying Deadweight", Likorsky's latest four-engine development, reflects 25 years' experience in the design and construction of multi-engine equipment. Officially designated as the XPBS-1, this huge flying boat is the U. S. Navy's largest patrol bomber. Likorsky Aircraft, one of the four divisions of United Aircraft Corporation, Bridgeport, Connecticut.



BOEING TRANSATLANTIC CLIPPER for Pan American

In the keen international rivalry for leadership in air transport America stands ready. Three magnificent new types of superliners will soon be winging their way through the skies, as America's bid for continued air supremacy. Keeping pace with the swift advance in aircraft design, Hamilton Standard is also ready. Its latest development, the HYDROWATIC quick feathering PROPELLER, will be fitted to each of the engines of these great new aircraft.

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new giant transport for United, American, British, Pan American and TWA

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A \$10,000 prize offered by the New York World inspired Glenn Curtiss to make the first long distance flight in the Western Hemisphere—Albany to New York—143 miles! When the special train that accompanied him had difficulty in keeping up, aviation sounded a warning that all land

transportation must look to its heels.

Last year, three Russians flew from Moscow to Portland, Oregon, to set the present all-time long distance record of 6,359 miles.

Between Curtiss' fight and that of the Russians lay 27 years of research and development to improve the inseparably linked fuel and engine. Between the Russians'

flight and the long distance record 27 years from now lies the same relentless program of research for the betterment of fuels and engines.

That is why Ethyl engineers, along with aviation engineers, are working continuously on further fuel and engine development. Ethyl Gasoline Corporation, Chrysler Building, New York, N. Y.

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WORK BENCHES
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RIGID

... so they give you
years more use



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lbs. 4 ft.
12 in. bench
Bench is extra

Semi-Portable
Type



"Hallowell" Work Benches are made on the shop floor with a firm, smooth working surface. Yet they are built so that they can be taken apart, set up again in another location and still be rigid. And that's something you'd never be able to do with a bench of wooden construction.

The Semi-Portable type bench is also a real asset. It provides a firm, smooth working surface that can easily be moved from one spot to another. Strong handles are provided that can be swung out of the way when not in use.

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94 ft. x 6 ft.
96 ft. x 6 ft.
98 ft. x 6 ft.
100 ft. x 6 ft.

FIFTY YEARS OF INSTRUMENT LEADERSHIP



TODAY

Weston is 50 years young!



FIFTY years ago, the Weston Electrical Instrument Corporation began its second half-century of leadership in electrical measurement. Naturally, it is an occasion justifying legitimate pride and self-satisfaction.

Yet, for this very reason, fifty years can be a dangerous age. The temptation to dwell upon past achievement can hinder the arrival of progress. At fifty, the will to challenge tomorrow's needs and tomorrow's difficulties vigorously and open-mindedly—as a youth with nothing to lose would challenge them—frequently grows weak.

There is one very good reason, however, why the beginning of a new half-century and finds Weston a typically young organization in its attitude toward new industrial wants, new methods for meeting them, and new techniques of manufacture. From the time

when Dr. Weston sketched the design for the first Model 1 instrument, pioneering became a deliberate Weston policy. Before the phrase "industrial research" came into the language, Weston engineers were busy at it!

Now, after fifty years, pioneering has become an ingrained habit at Weston—unfettered by the rash demands of boom-times or the uncertainties of leaner periods. So far this year, for example, four fundamental instrument improvements are going into production. Three more are in the test stage. A half-dozen others are on the drawing boards of the engineering department.

That is why, at the half-century mark, Weston is not stopping to "point with pride" at what has been accomplished in its first fifty years. Rather, we ask with a youthful enthusiasm we see no reason to suppress: What *is* Weston doing . . . will continue doing . . . all during the next . . . Weston Electrical Instrument Corp., 66 Irvinghous Avenue, Newark, N. J.

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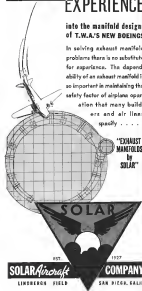
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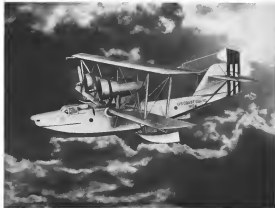
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put your advertising for them on the same basis as other publicity.

If you want competent and efficient men for your business, you will want to put your advertising for them on the same basis as other publicity.

If you want competent and efficient men for your business, you will want to put your advertising for them on the same basis as other publicity.

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Fly "Off Airway" Routes with EDO FLOATS

Into the wilds to land, fish or explore—no airplane offers you perfect freedom. Every take, storm or lay because your private airport, with an airway traffic rules to transmit you. Remote areas not reached unless you are ready to reach by air "the airplane way."

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LOOKING FOR SOMETHING?

and answer you are. Every country of AVIATION is. Some find what they are looking for in the editorial pages, some in the advertising by manufacturers, some in the "classified" advertisements. The latter include many advertisements making or offering "something" in equipment, plans, engine parts, products or business opportunities that you may be able to supply or want. You will always find something in the "classified" ads interesting information and sometimes profitable.

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comprise, in their subscription lists, a virtual classified directory of the most important men in America for the industrial advertiser. They are the leading publications in their respective fields, treated buying publics of the men who influence purchases of capital goods, equipment and supplies.

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FLEETWINGS does it again...

FLEETWINGS HYDRAULIC SELECTOR VALVE for Retracting Mechanisms

Presented in many phases of aircraft development FLEETWINGS valve is now found in the line of retractable landing gear. The FLEETWINGS HYDRAULIC SELECTOR VALVE is a revolutionary contribution to retractable landing gear mechanism of retracting and extending mechanisms for landing gear, tail wheels, flaps and other parts requiring locking or movement.

Designed for simplicity of operation and range of application the FLEETWINGS HYDRAULIC SELECTOR VALVE is available in a three port type for retracting and extending hydraulic systems and can be made in special order for either one, two or four separate systems.

In lock position it provides for hydraulic lock on the movable mechanism and unattended low pressure control on the hydraulic fluid from the pressure source through the valve and up to a reservoir. A simple 90 degree turn of a handle will completely and desired operation of any one of the movable systems connected. On completion of the movement a return 90 degree turn will again provide hydraulic lock and unattended operation of the fluid. And it weighs only 40 pounds.

Write for complete details

FLEETWINGS
 INCORPORATED
 BOSTON, MASS.



BERRYLOID AIRCRAFT FINISHES

ALUMINUM • BRASS • COPPER • INVAR • MONEL • NICKEL • STEEL • TITANIUM • ZINC



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or something you don't want that other readers of this paper can supply—or see—advertise it in

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THE DART

A new value in aircraft

DART presents its new model—a... a product designed expressly to meet the industry's demand for an airplane ideally suited to the practical needs of both the private owner and the commercial operator.

Two-place, cabin-type seating... powered with the 50 hp Lambert motor... 130 mph speed... priced in the medium class.

Write now for descriptive literature.



DART MANUFACTURING CORPORATION
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TO THE LIGHT PLANE OWNER

Franklin-



4AC-150 • ATC-134

for **38 YEARS** a famous name in the air cooled engine field, announces its new light aircraft engine,—the 4AC-150

COMPARE with the others

SERIES FIFTY	SERIES FORTY
50 HP at 2500	40 HP at 1850
Gasoline Consumption at Cruising Speed (2100 RPM)	Gasoline Consumption at Cruising Speed (1900 RPM)
3.41 gallons per hour	2.78 gallons per hour
Oil Consumption at 2100 RPM—5 drops per hour (includes Wicks) (includes tank) 100 pounds	

the **FRANKLIN** aircraft engine is

DEPENDABLE because its adequate cooling system assures a cool-running engine at all times. Further dependability is provided by ample bearing surfaces, full pressure lubrication to all bearings and valve mechanism, and hydraulic valve lifters.

EFFICIENT because its amazingly efficient cooling system permits the use of higher compression ratios which result in lower gasoline and oil consumption. The engine is rated for 70 octane gasoline, or better, and also uses 14 mm. extensive spark plugs. . . . and

COSTS LESS to maintain because the full pressure lubrication of its valve assembly, and the use of hydraulic valve lifters, prolong the life of valves and valve mechanism and render periodic valve adjustment unnecessary. Maintenance costs are further reduced through the use of steel backed, replaceable bearings.

—and **BETTER PERFORMANCE** is assured because the counter-balanced crankshaft eliminates vibration. Also, by using aluminum air deflector to force an even distribution of air over the cylinders, the engine will not overheat. These are but two of the features which contribute to the engine's maximum performance under the most severe operating conditions.

• **ASK YOUR DEALER for a demonstration flight.** For complete specifications of the Franklin 4AC-150, write for bulletin 138—free upon request.

AIRCOOLED MOTORS CORPORATION

Executive Office • 835 MADISON AVENUE
NEW YORK, N. Y.

Factory • SYRACUSE, N. Y.

AVIATION
May, 1939
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* OUR ROLE IN THE AIRCRAFT INDUSTRY

TODAY you take for granted the usefulness of Aluminum to aeronautics. But only yesterday, it seems, there was no "for granted" about it. When Aluminum was seriously proposed for aircraft construction, aviation engineers and designers wanted proof—proof that Aluminum would be helpful, proof that Aluminum would be economical, but proof, chiefly, that it would be reliable.

That skepticism was understandable, reasonable. A heavy, untested experiment might retard aviation progress by decades.

And there was, on our part, abundant plenty for attacking the problem. When Charles Martin Hall and his associates produced their first ingots of Aluminum, they could hardly sell their metal at any price until they had proved it could be rolled, cast, shaped into useful forms. To prove the point, they had to do the rolling and casting and shaping themselves, in their own shops.

In the same way, Aluminum Alloys have developed as a raw material for aircraft. The industry worked out design based on the potentialities of Aluminum.

Then it became our responsibility to make the capabilities of Aluminum Alloys serve practically, economically and reliably in all the many forms needed by the industry. We devoted the time and talents of a large technical staff to these problems, and backed them with the expensive equipment needed. There came a day when the men who build aircraft said almost unanimously: "Aluminum fits the needs of the aircraft industry. It is both useful and desirable."

But designers are wanting still greater fatigue resistance for one application, higher tensile strength for another, better strength at high temperature in a third, greater resistance to corrosion. . . .

So our technical staff keeps overhauling it.

The work continues. It must. It is our role in the aviation industry; the facilities for research and fabrication are one piece with the production of the virgin metal. The usefulness of the metal to you is part and parcel of the technical cooperation which goes with it. ALUMINUM COMPANY OF AMERICA 2182 Gulf Building, Pittsburgh, Pennsylvania.



ALUMINUM COMPANY OF AMERICA

AVIATION
May 1939



THE NEW PAN-AMERICAN CLIPPERS BY BOEING ...

Eclipse-Equipped

ECLIPSE PRODUCTS ON THE NEW BOEING "314"

Engine Starters * D. C. Generators
A. C. Generators * D. C. and A. C.
Dynamotors * Propeller Feather-
ing Hydraulic Pumps * Propeller
Feathering Hydraulic Pressure
Selector Valves * Carburetor Air
Temperature Controls * Flap Oper-
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Deicer Pumps * Remote Indicating
Flowmeters * Propeller Governor
Remote Controls * Fluid Check
Valves * Solenoid Relays * Igni-
tion Booster Coils.

THE natural pride which all America takes in the new Boeing "314" Pan-American Clipper Ships is shared by Eclipse. These magnificent 74 passenger flying boats—largest passenger airplanes to be placed in service in the World, powered with four 1500 horsepower Wright Cyclone engines, most powerful of their type, carry many units of Eclipse manufacture.

Years of satisfactory service has warranted this renewal of confidence and Eclipse is justly proud of this enviable record.

ECLIPSE AVIATION CORPORATION

EAST ORANGE, NEW JERSEY

(Subsidiary of Bendix Aviation Corporation)

